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(a) To be present and vote at all General Meetings, which are held on the first Monday in each month except in September and October.
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(f) To receive *gratis* copies of the *Journal and Proceedings* and *Memoirs* of the Society
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List of Accessions to the Library of the Asiatic Society of Bengal during the Quarter ending the 30th September, 1928

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Muhammad Ibn al-A'rābī *See* HIŠĀM IBN AL-KALBĪ et MUHAMMAD IBN AL-A'RĀBĪ

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The Yogāvatāropadeśa: A Mahāyāna Treatise on Yoga by Dharmendra

in its Tibetan Version with Sanskrit Restoration and English Translation

By

DURGACHARAN CHATTERJI

Vidyā-bhavana, Viśva bhāratī

INTRODUCTORY

The Yogāvatāropadeśa Tib *Rnal hbyor la hjug pahi man nag*, is a short treatise on yoga of the Mahāyāna school The Sanskrit original of this work has not as yet been found and seems to have been lost. But there are two translations in Tibetan as found in the Tanjur (Bstan-hgyur) Mdo, Ku fols 146ᵇ 1–147ᵇ 2 and Gi, fols 204ᵃ 2—205ᵃ 4 They are identical, only with some minor differences of reading here and there

As the colophon says the author of the Yogāvatāropadeśa is Ācārya Dharmendra and it has been translated into Tibetan by the Indian Pandita, Janārdana[1] in collaboration with a Tibetan interpreter named Bhikṣu Ratnabhadra (Lo-tsā-ba Dge-slon Rin-chen-bzan-po)

On the same subject and of the same school there is another work, viz Yogāvatāra Tib *Rnal hbyor la hjug pa* of which also the Sanskrit original is lost. This is a small work containing only ten stanzas which appear to have been composed in the Arya metre

The Tanjur Index mentions the Yogāvatāra thrice Mdo A, Ku, fols 145ᵇ 6–146ᵃ 8, and Gi, fols 192ᵇ.8–193ᵇ 1 But the text is not available in A The last two versions are almost alike

From the colophon we come to know that it was composed by Dinnāga and rendered into Tibetan by the Indian Pandita Dharmaśrībhadra and the Tibetan interpreter Bhikṣu Ratnabhadra, the same person, who was the assistant of Janārdana in the translation of the Yogāvatāropadeśa into Tibetan.

It is very interesting to note that the entire Yogāvatāra excepting the last stanza has been incorporated in the Yogā-

[1] Wrongly transliterated into Tibetan as Jaratna in YAU[1] and Jaraddāna in YAU[2]

vatāropadeśa without being mentioned as the work of a different author. It is, however, apparent that the latter work is an improved redaction of the former with some prefatory and concluding remarks in prose. The fact that the Yogāvatāropadeśa has taken the Yogāvatāra almost in its entirety without any mention of its name and author, clearly points to the popularity it earned.

Diṅnāga, the author of the Yogāvatāra, and the celebrated Buddhist teacher may be roughly placed in the fifth century A.D. So Dharmendra who bodily incorporated Diṅnāga's work in his own book was either contemporaneous with or posterior to Diṅnāga.

The Yogāvatāropadeśa is very sententious in its treatment of the subject matter and merely touches upon the several stages that an aspirant is to go through till prajñāpāramitā is obtained. A devoted and enthusiastic student of yoga should approach his preceptor in the prescribed manner and meditate upon the teachings imparted to him. He is further required to study the important scriptures, and, after having determined the nature of the ultimate truth, to apply himself to yoga in right earnest. Much emphasis is laid upon the necessity of controlling the outgoings of the mind, which, when fully effected is followed by supernatural faculties, and the yogin is then in a position to do immense good to the world. The Yogāvatāropadeśa enjoins that any intricate problem concerning yoga is to be known orally from the preceptor, and thus shows that there is an esoteric aspect of the yoga doctrines which can be interpreted by no mere study of books but by the words of the preceptor. It concludes with a sentiment quoted from the Buddha that those who take recourse to books alone disregarding the prescribed rules sadly fail in their purpose and come to utter grief.

In editing the text of the Yogāvatāropadeśa I have made use of the four xylographs mentioned below as existing in the Tanjur of the Viśvabhāratī Library, viz. two of the Yogāvatāropadeśa and two of the Yogāvatāra. Wherever there is any difference of reading I have accepted that which appears to be the most suitable and have shown the variants in the footnotes. I have also attempted to restore the Sanskrit original from the Tibetan version.

XYLOGRAPHS COLLATED

1. YAU¹=Mdo, Ku, fols 146ᵇ.1–147ᵇ 2.
2. YAU²=Mdo, Gi, fols 204ᵃ 2–205ᵃ 4.
3. YA¹ =Mdo, Ku, fols 145ᵇ.6–146ᵃ.8.
4. YA² =Mdo, Gi, fols 192ᵇ 8–193ᵇ 1.

The references to folios are according to Cordier.

༄༅། རྒྱ་གར་སྐད་དུ། ཡོ་གཱ་བ་ཏཱ་རོ་པ་དེ་ཤ།།

བོད་སྐད་དུ། རྣལ་འབྱོར་ལ་འཇུག་པའི་མན་ངག །།

༄༅། རྗེ་བཙུན་བླ་མ་རྣམས་[1]ལ་ཕྱག་འཚལ་ལོ།

ཐམས་ཅད་མཁྱེན་པ་ལ་ཕྱག་འཚལ་ལོ།

དེ་ནི་ཐེག་པ་ཆེན་པོ་ལ་ལྷག་པར་མོས་པའི་དད་པ་ཅན་[2]རིགས་ཀྱི་བུས་གསོལ་བ་བཏབ་པ་ངག་ལ་སློབ་བསྐྱེད་ཅིང་ཐར་པ་མ་ལུས་པ་འདོད་པ་ལ་[3]། སྔར་བཤད་པའི་མཚན་ཉིད་ཅན་གྱི་ཡེ་ཤེས་རྟོགས་པར་བྱ་བའི་[4]ཕྱིར་ཐམས་ཅད་ཐབས་ཉེ་བར་བསྟན་པས། བདག་དང་གཞན་གྱི་དོན་རབ་ཏུ་འགྲུབ་པར་བྱ་བའི་ཕྱིར་ཤེས་རབ་ཀྱི་ཚུལ་རྗེས་སུ་དྲན་ནས་[5]། དེ་བསྟན་པའི་མན་ངག་བསྒོམ་པའི་རིམ་པའི་ཚོ་ག་འདིར་ཅུང་ཟད་ཅིག་བཤད་པར་བྱའོ། ཐེག་པ་ཆེན་པོར་ཇི་སྐད་དུ་བཤད་པའི་ཡེ་ཤེས་མངོན་པར་རྟོགས་པར་འདོད་པས་[6]། དད་པ་དང་གུས་པ་དང་ལྡན་པས་[7]། དེའི་ཚུལ་ལས་བཤད་པའི་ཚོ་གའི་རིམ་པ་སྔོན་དུ་འགྲོ་བས་བླ་མ་ལ་གསོལ་བ་བཏབ་སྟེ། དེའི་དྲིན་གྱིས་[8]ཐོབ་པའི་ལུང་གི་[9]བླ་ན་མེད་པའི་ཡེ་ཤེས་ཀྱི་ཐབས་ཀྱི་[10]མན་ངག་གི་རྣལ་འབྱོར་བསྒོམ་[11]པ་བརྩམ་པར་བྱའོ།། དེ་ལ་དང་པོར་[12]རེ་ཞིག།

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[1] YAU2 རྣམ་པ   [2] YAU2 adds ཀྱི after ཅན

[3] YAU2 no ཚིག་ཤད or stop here.

[4] After བའི YAU1 ཐབས་ཉེ, YAU2 ཕྱིར་ཐམས་ཅད་ཉེ.

[5] YAU2 no ཚིག་ཤད

[6] YAU2 པ for པས, no ཚིག་ཤད after པས, but after དད་པ་ཅན.

[7] YAU2 no ཚིག་ཤད.   [8] YAU1 ཀྱི   [9] YAU2 གིས

[10] YAU2 ཀྱིས.   [11] YAU1 བསྒོམས   [12] YAU1 པོ.

I.

བསྟན་བཅོས་རྒྱ་ཆེན་པོ་ནི་ཐོས་ནས་སུ།
དོན་དམ་དེ་བཞིན་ཉིད་ནི་ངེས་བྱས་ལ།
དད་ལྡན་དེ་ནི་འཇམ་པའི་སྟོན་གནས་དེ[1]།
བློ་དང་ལྡན་པས་རྣལ་འབྱོར་བརྩོན་པར་བྱ།།

II

གཟུང་དང་འཛིན་དང་གཉིས་ཀ་གཉིས་[2]མིན་དང་།
བདག་དང་གཞན་དང་སྨྲ་ངན་འདས་པ་དང་།
འཁོར་བ་ཞེས་བྱའི་རྣམ་རྟོག་མང་པོ་ནི།
རབ་[3]ཏུ་བཏང་ལ་ཡིད་[4]ནི་[5]མཉམ་པ་བཞག[6]།།

III.

སྒྱུ་མ་དྲི་ཟའི་གྲོང་ཁྱེར་ལྟ་བུར་ནི།
ཤེས་བྱ་མ་ལུས་རྣམ་པར་བལྟས་ནས་སུ།
[7]དེ་བཞིན་ཉིད་ཀྱི་ཡེ་ཤེས་རྡོ་རྗེ་ཡི[8]།
ལུས་ཀྱི་འཁྲུལ་འཁོར་རབ་ཏུ་གཞིག་པར་བྱ།།

IV

རྣམ་པ་ཐམས་ཅད་དུ་ནི་རབ་མཛེས་ལ།
ཐིག་དང་ཐ་མའི་ཚ་བྲལ་རྣམ་[9]མི་རྟོག།

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1 YAU² རེ

2 YA¹ གཉེ་ག.

3 YA¹, YA² རིག ཏུ སྤྱངས for རབ ཏུ་བཏང

4 YA² ཡང for ཡིད.

5 YA¹ ཀྱི, YA² ན for ནི.

6 YA¹ གཞིག

7 The last two lines of this śloka and the whole of the next are omitted in YA².

8 YAU² ཡིད.

9 YAU¹ རྣམས

དྲི་མ་མེད་པའི་འོད་ཟེར་སྟོང་གིས་ནི།
ཀྱུན་པ་ངེས་གསལ་མཁའ་དང་མཚུངས་[1]པ་ཡིན།།

V

རང་གི་སྣང་[2]བ་[3]ཙམ་གྱི་ངོ་བོ་རུ།
གཟོད་ནས་སྐྱེ་བ་མེད་པའི་རང་སེམས་མཐོང་།
གང་གིས་ཀྱང་ནི་དེ་མཐོང་གྱུར་པ་དག།
དེ་ཡང་དེ་བཞིན་དུ་ནི་བལྟ་[4]བར་བྱ།།

VI

དམིགས་པ་མེད་དང་བཅས་པའི་སེམས་ཉིད་ནི།
དེ་བཞིན་ཉིད་དང་ཡང་དག་མཐའ་རུ་བཤད།
དེ་ལྟར་རིམ་གྱིས་བསྒྲུབ་[5]པར་གྱུར་པ་ལས་[6]།
མིང་དུ་འདུ་[7]ཤེས་འགོག་པ་ཐོབ་པར་འགྱུར།།

VII

དེ་ལ་[8]ཡང་དག་རིག་པར་སྦྱོར་བ་ལས།
འབད་པ་མེད་པར་མངོན་ཤེས་ལྔ་རུ་[9]འགྱུར།
དེ་དང་མངོན་པར་ལྡན་པའི་རྣལ་འབྱོར་པ་[10]།
འགྲོ་བའི་དོན་ནི་དཔག་དུ་མེད་[11]པ་བྱེད།།

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1 YAU1 མཚུང 2 YA2, YAU1, YAU2 རྣམ 3 YA2 པར.
4 YAU1, YAU2 ལྟ for བལྟ 5 YAU2, YA1, YA2 བསྒྲུབས.
6 YAU1 ལ 7 YA1 ཤེས་པ, YA2 ཚོར་བ for འདུ་ཤེས.
8 YAU1, YAU2 ལས 9 YAU1, YAU2 ལྡན.
10 YA2 པས. 11 YA1 པར

VIII.

འདི་ནི་ཡོངས་སུ་རྫོགས་པའི་རྣལ་འབྱོར་པ།
ཤིན་དུ་ཡུན་རིང་དུས་སུ་གནས་པར་འགྱུར།
ལུས་ནི་རྡོ་རྗེ་ལྟ་བུར་མི་ཤིགས་ཤིང་།
ཉོན་མོངས་བདུད་ལ་སོགས་པས་གཡོ་མི་འགྱུར།།

IX

ཤེས་རབ་ཕ་རོལ་ཕྱིན་པ་ཞེས་བྱ་ཡི[1]།
རྣལ་འབྱོར་འདི་དང་རྟག་ཏུ་རབ་ལྡན་པ།
ནམ་མཁའ་མཛོད[2]་ལ་སོགས་པའི་ཏིང་ངེ་འཛིན།
མང་པོ་རྣམས་ནི་ཡང་དག་རྫོགས་པར་འགྱུར[3]།།

འདི་ལྟར་ཟབ་མོ་ཡི་དོན་གང་ཅི་ཡང་རྟུང་བ་རྟོགས་པར་དཀའ་བ་དེ་ནི་བླ་མའི་ཞལ་ནས་ཇི་ག་ཇི་ལྟ་བ་བཞིན་དུ་བཤད་པ[4]་བཟུང་བར་བྱའོ། རིགས་ཀྱི་བུ་འམ་རིགས་ཀྱི་བུ་མོ་དད་པ་དང་ལྡན་པ[5]་གང་ལ་ལ[6]་ཕ་རོལ་ཏུ་ཕྱིན་པའི་ཚུལ་གྱིས་སྐྱུང་བ་སྤྱོད་དོ[7]། ཇི་སྐད་དུ་བཤད་པའི་རིམ་པའི་ཚོགས་སེམས་ཅན་ཐམས་ཅད་གདོན་པར་བྱ་བའི་ཕྱིར། སེམས་བསྐྱེད་ནས་བླ་ན་མེད་པའི་ཡེ་ཤེས་ཀྱིས། མན་ངག་གི་རྣལ་འབྱོར་བརྩམས་

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1 YAU2, YA2 པའི   2 YAU1 འདོད

3 After this both YA1 and YA2 add the following Śloka

བདག་གི་རྣལ་འབྱོར་ལ་ནི་འཇུག་པ་རྣམས།
ཡང་དག་སྦྱོར་བས་དགེ་བ་གང་བསགས་པ།
དེས་ནི་འགྲོ་བ་ཐམས་ཅད་རབ་སྦྱུར་བར།
ཐམས་ཅད་མཁྱེན་པའི་ཡེ་ཤེས་ཐོབ་པར་ཤོག།

In *a* YA1 གིས for གི.   4 YAU2 པར

5 YAU1 པས   6 YAU2 ལས   7 YAU2 པས for དོ

ནས། བརྩོན་འགྲུས་འབར་བ་དང་ལྡན་པས་བསླབས་པའི་སྟོབས་དང་
ལྡན་པ་དེ་[1]ནི་རིང་པོ་[2]མི་ཐོགས་པར་ཚེ་[3]ཉིད་ལ་ཇི་སྐད་དུ་བཤད་པའི་ཡེ་
ཤེས་ཐོབ་པར་འགྱུར་རོ། གང་[4]ཡང་ཇི་སྐད་དུ་བཤད་པའི་ཚོ་ག་མེད་
པར་ཀླགས་ནམ་ལ་བརྟེན་པ་ཙམ་གྱིས་འཇུག་པ་དེ་དག་ནི་[5]ཇི་སྐད་དུ་
བཤད་པའི་དངོས་གྲུབ་ལ་ཀྲུབ་ཀྱིས་[6]ཐོགས་པར་འགྱུར་ཞིང་། སྡུག་
བསྔལ་བ་དང་ཡིད་མི་བདེ་བ་སྣ་ཚོགས་འབྱུང་བར་འགྱུར་རོ་ཞེས་ཟབ་
མོ་འི་ཚུལ་ལས་དེ་བཞིན་གཤེགས་པས་གསུངས་སོ།།

རྣལ་འབྱོར་ལ་འཇུག་པའི་མན་ངག་སློབ་དཔོན་ཆོས་ཀྱི་དཔང་པོས་
མཛད་པ་རྫོགས་སོ།། །རྒྱ་གར་གྱི་མཁན་པོ་ཛ་ར་ནྡ་[7]དང་། ཞུ་ཆེན་གྱི་
ལོ་ཙཱ་བ་དགེ་སློང་རིན་ཆེན་བཟང་པོས་བསྒྱུར་ཅིང་ཞུས་ཏེ་གཏན་ལ་ཕབ་
པའོ།།

THE RECONSTRUCTED TEXT IN SANSKRIT

योगावतारोपदेशः ।

भारतभाषायां योगावतारोपदेशः ॥

भोटभाषाया नॅल् 'ब्योर् ल 'जुग् प'इ मन् ङग् ॥

गुरुभट्टारकेभ्यो नमः ।

सर्वज्ञाय नमः ।

महायानाधिमुक्तस्य श्राद्धस्य कुलपुत्रस्य प्रार्थनाजनितोत्साहस्य
निःशेषमोक्षकामस्य पूर्वोक्त[1]लक्षणावबोधाय सर्वोपायोपदेशेन स्वपरार्थ-

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[1] YAU[2] དེས [2] YAU[2] པོར [3] YAU[2] འདི after ཚེ

[4] YAU[2] omits གང [5] YAU[1] ཚེག་ཤད after ནི [6] YAU[1] ཀྱི

[7] For ཛ་ར་ནྡ YAU[2] ཛ་ར་ནྡྲ་ན

सुविज्ञये प्रज्ञाक्रममनुसृत्य तच्छासनोपदेशभावनाक्रमविधिरिह किञ्चिद् वक्तव्यः। महायाने यथोक्तज्ञानाभिसमयकामः आद्यक्तद्विधानोक्तविधिक्रमपूर्वकं गुरोः प्रार्थनां स्थापयित्वा तत्कथ्याधिगतागमानुसरज्ञानोपायोपदेशयोगभावनामारभेत।

तत्र प्रथमं तावत्—

(१)

शास्त्रं प्रथितं श्रुत्वा निश्चित्यापि परमार्थतत्त्वानि।
श्रद्धायुक्तः प्राज्ञो योगं मद्दात्मने युञ्ज्यात्॥

(२)

संसारो निर्वाणं स्वपरौ द्वयमद्वयं तथा ग्राह्यम्।
ग्राहक इति च विकल्पांस्त्यक्त्वा चित्त समायन्नम्॥

(३)

मायागन्धर्वनगरसदृशं ज्ञेयं विलोक्य निःशेषम्।
तथताज्ञानाग्निना शरीरयन्त्रं परीक्षेत॥

(४)

आद्यन्तांशरहितमविकल्पं सर्वप्रकारवरशोभम्।
विमलमरीचिसहस्रैरपावृततमिस्रगगनसंकाशम्॥

(५)

स्वाभासमात्ररूपं पश्येत् प्रथमादजं स्वचित्तं च।
येन च दृश्यत एतद् द्रष्टव्यं तदपि हि तथैव॥

(६)

कथितमनात्मं चित्तमेव तथता च भूतकोटि[2]श्च।
ईदृक्क्रमशिक्षातो संज्ञावेदितनिरोध[3]लाभः स्यात्॥

(७)

तस्मिन् सम्यक्स्पर्शात् पञ्चाभिज्ञा[4] भवन्त्यनायासम्।
तदभिव्यक्तो योगी जगदर्थं साधयत्यपरिमेयम्॥

(८)

परिसम्पन्नो योगी तिष्ठति कालं सुदीर्घमप्येषः ।
तनुरश्मनिरिवाश्रयिला निश्चेष्टा क्षेशमारा[5]द्याः ॥

(९)

प्रज्ञापारमिता[6]द्या एते योगा सदा समुत्कृष्टाः ।
बहवो हि गगनगञ्जा[7]द्याः सम्पन्नाः समाधयः सन्ति ॥ *

एवं यः कश्चिद् युक्तो दुरवगमो गम्भीरोऽर्थः स गुरुमुखाद् यथावदुक्तो ग्राह्यः । यः कश्चित् कुलपुत्रो वा कुलदुहिता वा श्राद्धः शीलपारमित[8]या धृतचारित्रः, स यथोक्तक्रमविधिना सर्वे सत्त्वा मोचनीया इति चित्तमुत्पाद्यानुत्तरज्ञानेन योगोपदेशमारभ्य वीर्योद्दीप्तः शिक्षाबलश्चिरमप्रतिहतोऽस्मिन्नेव जन्मनि यथोक्तज्ञानं लभते । ये तु यथोक्तविधिमन्तरेण पुस्तकाश्रयमात्रेण प्रवर्त्तन्ते ते यथोक्तसिद्धिपराङ्मुखा भवन्ति तेषां विविधदुःखदौर्मनस्य चोद्भवतीत्युक्तं तथागतेन गम्भीरशीले[9] ।

योगावतारोपदेशो धर्मेन्द्रकृतः सम्पूर्णः । भारतीयोपाध्यायेन जनार्द्दनेन महाशोधकेन भिक्षुणा रत्नभद्रेण च परिवर्त्य शोधयित्वा निर्णीतः ॥

ENGLISH TRANSLATION.

In the Indian language Y o g ā v a t ā r o p a d e ś a In the Tibetan language R n a l h b v o r l a h j u g p a h i m a n n a g.

Obeisance to the Adorable Teachers

Obeisance to the Omniscient One

Here is told in brief the order of the processes of meditation upon the teaching of the doctrines consistent with the different stages of wisdom for the full attainment of all desired objects both of one's own self and of others Such attainment results from the instructions as to the means of comprehending the aforesaid knowledge by a devoted and noble youth inclined to the Mahāyāna, energetic on account of his prayers, and desirous of absolute emancipation A devoted person desiring

* The following is here an additional stanza as found in YA[1] and YA[2]

योगावतारभावे सम्यग्योगाचित शुभं मे यत् ।
लभतां तेन त्वरितं सर्वज्ञत्वं जगत् सर्वम् ॥

full comprehension of the knowledge as taught in the Mahāyāna should offer prayers to his preceptor in the prescribed manner and begin the meditation of yoga by following the instructions regarding the ways of attaining the supreme knowledge of the sacred lore as obtained through his preceptor's kindness Here at the outset -

1 Having listened to the well-known scriptures and determined the principles of the supreme truth, a wise person should with devotion practise yoga on a soft seat

2 Transmigration and emancipation, self and not-self, duality and non duality, knower and knowable,—foregoing these imaginations the mind becomes concentrated

3 Looking upon the whole knowable as a trick of jugglery or as the city of the celestial choir, one should test one's bodily mechanism by means of the thunderbolt of t a th a t ā j ñ a n a (in order to ascertain whether there is anything real in it).

4-5. Devoid of beginning or end or part, as well as of imaginations, beautified with the splendid graces of every kind and like the sky wherefrom darkness has been dispelled by thousands of bright rays—from the beginning thus should one view one's mind as unborn and as having the form of its own reflections That also by means of which such knowledge comes is to be viewed likewise

6. Mind without an object of thought is called t a th a t a and bh ū t a k o t i From a gradual training of this kind comes the cessation of consciousness and sensation

7 From a right contact with that arise the five supernatural faculties without any difficulty The yogin thus illumined does immense good to the world

8 The perfected yogin long remains so and his body becomes strong like thunderbolt and k l e s a m a r a and others become quiescent

9 These yogas of p r a j ñ a p ā r a m i t ā are always excellent Many are the s a m a dh i s like g a g a n a g a ñ j a [1]

Now any subject that is appropriate, profound and not easily comprehensible should be learnt orally from the teacher Any devoted and noble young man or woman whose character has been purified by s ī l a p ā r a m i t a and who thinks in his or her mind that all beings are to be liberated in accordance with the prescribed manner and begins to act upon the teachings of yoga by means of the supreme knowledge, obtains the said knowledge in this very life, being fired with enthusiasm, strong through discipline and ever irresistible "Those who have recourse to books only, foregoing the prescribed process,

[1] The additional stanza as found in YA[1] and YA[2] can be thus translated Through the merits that have accrued to me from right application to the Y o g a v a t ā r a, let the whole world attain to omniscience without delay

fail to obtain success and to them come various miseries and mortifications"—this was said by T a th ā g a t ā in the G a m bh ī r a ś ī l a

Here ends the Y o g ā v a t ā r o p a d e ś a of Dh a r m e n d r a It is translated, revised and ascertained by the Indian teacher J a n ā r d a n a and the great revisor Bh i k s u R a t n a bh a d r a

NOTES ON THE SANSKRIT RECONSTRUCTION

1 पूर्वोक्त I could not ascertain what the author refers to by the word *pūrvokta*-

2 तथता भूतकोटि. These two words which are synonymous are used in the Buddhist philosophy to denote the ultimate truth that the whole of the visible world all phenomena have no reality (nihsvabhāvatā)

3 संज्ञावेदितनिरोध In Pali सञ्ञावेदयितनिरोध It is the final stage of Arūpa meditation when not only sensation or consciousness but also all the mental properties (चेतसिका धम्मा) headed by contact (फस्स, Skt स्पर्श) together with the mind itself are suppressed

4 पञ्च अभिज्ञा. The five supernatural faculties viz. 1 Divine sight (दिव्यचक्षु), 2 Divine hearing (दिव्यश्रोत्र), 3 Knowledge of other's thoughts (परचित्तज्ञान), 4 Memory of former abodes (पूर्वनिवासानुस्मृति), and 5 Magical science (ऋद्धि) Sometimes a sixth is added viz , the knowledge how to destroy human passion (आस्रवक्षयकर ज्ञान)

5 क्लेशमार *Klesa* or original sin is the evil principle, the *māra* or hindrance to the attainment of *nirvāna* See *Childers' Pali Dictionary*, p 241

6 प्रज्ञापारमिता. Perfection of wisdom

7. गगनगञ्ज The name of a particular kind of samādhi See *Dharmasamgraha, CXXXVI*

8 शीलपारमिता The transcendental virtue of morality One of the ten *pāramitās*

9 गम्भीरशील It seems to be the name of a book

The Hindu Method of testing Arithmetical Operations.

By BIBHUTIBHUSAN DATTA, (*University College of Science, Calcutta*)

Introductory

It was Taylor who first stated in 1816 A D, that the Hindus did not know the method of testing arithmetical operations by casting out the nines [1] That statement was repeated in 1907 A D by Kaye in a slightly modified form "There is not the remotest reference," says Kaye, "to any such rules or anything akin to them in any of the known writings of the Hindu mathematicians prior to Avicenna" [2] Neither the original statement, nor its modification is correct For the method of verification by casting out the nines does certainly occur in a Hindu mathematical treatise of the 10th century It is the *Mahā-Ārya-siddhānta*, or in short the *Mahā-siddhānta* [3] Its author, Āryabhata II (c 950 A D) lived prior to the time of Avicenna (980–1037 A D) [4] This method is not found, nor any other similar method is found, in any of the known Sanskrit mathematical works These facts were pointed out in 1910 A D by Sudhakara Dvivedi in the synopsis of the contents published in his edition of the *Mahā-siddhānta* But the subsequent writers have entirely ignored him And inspite of the efforts of this scholar to dispel the mistaken assertions of the previous writers Kaye re-asserted in 1915 A D. that the proof by nine does not appear in any Hindu work before the 12th century [5] and his mis-statement has been repeated by some of the modern historians of mathematics [6] The present

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[1] J Taylor, *Lilawati*, Bombay, 1816, Introduction, pp 7, 10

[2] G R Kaye, "Notes on Indian Mathematics—Arithmetic Notation," *Journ Asiat Soc Bengal*, III 1907, p 490

[3] *Mahā-siddhānta*, ed Sudhakara Dvivedi, Benares, 1910, ch xviii verses 67–70

[4] There is a bit of uncertainty about the exact time of Āryabhata II. There is no doubt that he lived before Bhaskara (born 1114 A D) who has referred to him Sankar Balkrishna Dikshit, Sewell and others have put his date about 950 A D And this date has not been disputed by Kaye or any one else

[5] G R Kaye, *Indian Mathematics*, Calcutta, 1915, p 34

[6] *Vide* David Eugene Smith, *History of Mathematics*, vol II, Boston 1925, p. 152, Florian Cajori, *History of Mathematics*, 2nd ed, New York 1922, p 91 These writers have been admittedly influenced by the writing of Kaye Professor Smith, however, still believes in the Hindu origin of the proof by nine; and in an earlier work, Professor Cajori also expressed in favour of the Hindus (*History of Elementary Mathematics*, New York 1905, p 96)

paper aims at correcting these wrong statements and at a discussion of the undecided question of the origin of the method of checking results by casting out the 9's, as also the probable indebtedness of the Hindus and the Arabs to each other for this method, with a view to reopen them It should be pointed out that there are certain other historians, such as Cantor,[1] Paul Tannery,[2] Fink,[3] and Heath,[4] who believe that the Hindus discovered the proof by nine

Hindu Method of Proof.

Āryabhata II (*c.* 950 A.D) says

" Add together the own digits of the numbers forming the multiplicand, multiplier and product up to one place [5] such should be done with the dividend, divisor quotient and remainder, etc Then if the number (of one digit) resulting from the multiplication of the numbers obtained from the multiplier and the multiplicand be equal to the number obtained from the product, the multiplication is correct If the number which results from the product of the numbers obtained from the quotient and the divisor plus the remainder be equal to that obtained from the dividend, the operation is correct Add together the digits of a number, its (nearest) square root (in integers) and of the remainder If the number obtained from the square of the number obtained from the square root plus the number obtained from the remainder be equal to the number resulting from the given number, the root-extraction is correct. If the number resulting from the cube of the number obtained by adding the digits of the cube root, plus the number obtained from the remainder, be equal to the number resulting from a given number, then the operation is right Such are the easy tests of correctness (*śodhanikā*) of multiplication, etc ," (*Mahā-siddhanta*, xviii 67–70) [6]

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[1] M Cantor *Geschichte der Mathematik* Bd 1 Leipzig 1907, p 763

[2] Paul Tannery, *Mémoires Scientifiques*, t 1, Paris, 1912, p 185

[3] Karl Fink, *Brief History of Mathematics*, translated into English by W W. Beman and D E Smith, Chicago, 1910. p 35

[4] T. Heath, *History of Greek Mathematics*, Oxford, 1921, vol I, p 117 and vol II, p 549

[5] That is, the digits of the number should be added together the digits of the sum thus obtained should be again added and the process should be continued until there remains a number of one digit only

[6] गुण्यगुणकगुणनभुवां राशीनां स्वाङ्कयोगकं कार्यं ।
क-स्थानन्तस्तद्वद्भाज्यच्छेदाप्तिशेषकादीनाम् ॥ ६७ ॥
तद्गुण्यगुणकघातयुतितुल्ये गुणनोद्भवे स्फुटं गुणनम् ।
आप्तिच्छेदकघाते शेषयुते यो भवेदङ्कः ॥ ६८ ॥
तेन समाने भाज्ये स्पष्टं लब्धं तथा शेषम् ।
वर्गैक्यं पदयुतिकृतिशेषैक्यसमे स्फुटौ स्वपदवर्गौ ॥ ६९ ॥

The *rationale* of the above rules will be understood from the following:

Let

$$n = d_m \; d_{m-1} \; \ldots \; d_2 \; d_1$$

be a number of *m digits* written in the decimal place value notation. Let $S(n)$ denote the sum of its digits, $S^2_{(n)}$ the sum of the digits of $S(n)$ and so on.

Now $\qquad n = d_1 + 10d_2 + 10^2 d_3 + \ldots + 10^{m-1} d_m$,

$\qquad\qquad S(n) = d_1 + d_2 + d_3 + \ldots + d_m$

Therefore $\; n - S(n) = 9(d_2 + 11d_3 + \ldots)$,

Whence $\qquad n \equiv S(n) \pmod{9}$

Similarly $\qquad S(n) \equiv S^2(n) \pmod{9}$

$\qquad\qquad \ldots \quad \ldots$

Let $\qquad S^{k-1}_{(n)} \equiv S^k_{(n)} \pmod{9}$

be the last possible relation of this kind, so that $S^k_{\,n}$ will be a number of *one* digit, say n', which is certainly less than or equal to 9.

Adding the congruences, we obtain

$$n \equiv n' \pmod{9}$$

Thus the number of one digit obtained by adding the digits of a number repeatedly, is equal to the remainder obtained by dividing the given number by 9.

घनयोगसमे घनपद्योगघनैक्यं भजथके तौ च ।

एव गुणनादीनां शोधनिकेय सुखोपायात् ॥ ७० ॥

By way of illustration take the number 746143625. Its nearest square root in integors is 27315 and the remainder is 34400, the nearest cube root is 907 and the remainder is 982. Now adding the digits of all these numbers repeatedly we get

$7+4+6+1+4+3+6+2+5=38 \quad 3+8=11, \quad 1+1=2,$
$2+7+3+1+5=18, \quad 1+8=9,$
$3+4+4+0+0=11 \quad 1+1=2,$
$9+0+7=16, \quad 1+6=7$
$9+8+2=19, \quad 1+9=10 \quad 1+0=1$

Thon $\qquad$ (square root)^2 + remainder $= 9^2 + 2 = 83$

Now adding the digits of this number we get

$$8+3=11 \quad 1+1=2$$

which is the number obtained out of the given number, hence the square root and remainder are correct.

Again $\qquad$ (cube root)^3 + remainder $= 7^3 + 1 = 344$

Adding the digits of this number

$$3+4+4=11 \quad 1+1=2,$$

so that the cube root and remainder are also correctly obtained.

Now if there be a number N which is equal to the continued product of p other *numbers* $n_1, n_2, \ldots, n_p$, plus or minus another number R, then we write

$$N = n_1 n_2 \ldots n_p \pm R.$$

Now, let
$$n_1 \equiv n'_1 \quad (\text{mod. } 9).$$
$$n_2 \equiv n'_2 \quad (\text{mod } 9)$$
$$\ldots\ldots\ldots\ldots\ldots\ldots$$
$$n_{(p)} \equiv n'_{(p)} \quad (\text{mod. } 9).$$

Multiplying the congruences, we obtain

$$n_1 n_2 \ldots n_{(p)} = n'_1 n'_2 \ldots n'_p \quad (\text{mod. } 9)$$

Further let
$$R \equiv r' \quad (\text{mod. } 9).$$

Therefore $n_1 n_2 \ldots n_p \pm R \equiv n'_1 n'_2 \ldots n'_p \pm r' \quad (\text{mod. } 9).$

Hence $N \equiv n'_1 n'_2 \ldots n'_p \pm r' \quad (\text{mod } 9)$

In particular, if

$$n_1 = n_2 = \ldots = n_p = n, \text{ say}$$

Then will be $n'_1 = n'_2 = \ldots = n'_p = n'$, say

Therefore $N = n^p \pm R$

and $N \equiv n'^p \pm r' \quad (\text{mod } 9)$

From the above will easily follow the rules formulated in the *Mahā-siddhānta*.

Arabic Method.

The method of proof by casting out the 9's is found in the works of various Arab mathematicians from Al-Khowârîzmî (c 825 A D.) onwards It is called *tarazu* or balance in Arabic The early writers confined themselves to the application of the test to the verification of Doubling and Multiplication only It came into general use in the 11th century, largely due to the influence of Avicenna (c 1020 A.D) Al-Kharkhi (c 1020 A D) and Al-Nasâwi (c. 1030 A D), when it was applied to all the four cardinal arithmetical operations together with the square and cube roots. "Regarding the verification of squares," says Avicenna, "according to the Hindu method (*fi al-tarik al-hindasi*), there is invariably 1 or 4 or 7 or 9 Now to 1 corresponds 1 or 8; to 4, 2 or 7, to 7, 4 or 5, and if it is 9, there will be 3 or 6 or 9."[1] That is a property of all the

[1] F. Wœpcke, "Mémoire sur la propagation des chiffres Indiens," *Journal Asiatique*, Series 6, tome 1, 1863, pp 500 et sq.

square numbers is that, to the modulus of 9, they must be equivalent to 1 or 4 or 7 or 9. Further, if a number, when divided by 9, leaves 1 as remainder, the square root of that number, when divided by 9, will leave 1 or 8 as remainder. If a number when divided by 9, leaves 4 as remainder, its square root, divided by 9, will leave 2 or 7 as remainder If a number, divided by 9, leaves 7 as remainder, its square root, divided by 9, will leave 4 or 5 as remainder If a number, divided by 9, leaves 9 (that is zero) as remainder, its square root, divided by 9, will leave 3 or 6 or 9 as remainder[1] Avicenna has similar rules for the verification of the cube roots "A property of the cubes," says he, 'consists in that,—as the means of verification according to the manner of operation of the Hindu arithmetic (*al-hisâb al-hindasi*), I take the proof that is employed in this calculation,—it is always 1 or 8 or 9 If it is 1, the units of the number that is elevated to the cube are 1 or 4 or 7, if it is 8, they are 2 or 5 or 8, if it is 9, they are 3 or 6 or 9' In the 13th century the Arab mathematicians devised checks by other numbers besides 9 but none of them came into common use[2]

Comparison.

It will be found on comparison that the Hindu and the early Arab methods of checking the results of fundamental operations of Arithmetic, are the same for all practical purposes, though the intervening steps in the process are different Both are, in fact, "proof by nine" For as has been already pointed out the number of one digit required to be obtained in the Hindu method by the repeated addition of the digits of any given number is equivalent to the remainder when the given number is divided by 9 They also differ in certain other notable features The Arabs formulated their rules with a view to the verification of the *powers*—(of course the second and the third powers only)—of a given number, whereas the Hindu rules had in view the reverse operation that is extraction of *roots* Looked from the point of view of similar operations, it is obvious that the Arab rules can be useful in case of those numbers which are *perfect* squares or cubes, whereas the Hindu rules will be equally available in case of *imperfect* squares and cubes also Similarly for the division The early Arabs applied the check by casting out the 9's to division without a remainder The Hindus had rules for testing all kinds of division whether with or without a remainder Hence in all respects the Hindu rules are more complete and general than the Arab rules

[1] Note that Avicenna avoids speaking of the zero as remainder, in those cases he takes the remainder to be 9

[2] D E Smith, loc cit, p 154

Indeed the early Arabs seem to have been ignorant of the process of verification of the imperfect square and cube numbers and also of division when there is a remainder Maximus Planudes (lived probably about 1260–1310 A D) who stated "the proof by nine" to be of Indian origin, but who derived his knowledge of it from the Arab intermediaries, does not apply the test to cases of division with a remainder [1] In the later Arab mathematical works, e g., in the *Kholâsat al-hisâb* of Behā Eddin (c 1600 A D.),[2] the proof is stated in as general a way as in the *Mahā-siddhānta* Again the Arabic rules, at least in the forms into which they have been put by Avicenna, appear to have been obtained more or less in an empirical way On the other hand the Hindu rules are perfectly rational and evince a greater knowledge of the theory as well as the practice on the part of the propounder. Maximus Planudes adds the digits of the number once and then divides the sum by 9 But the injunction of the Hindu rules is to repeat the first process to the finish so the second process of division by 9 is no longer required

Origin of the proof by nine

There has been much deliberation in recent years about the origin of proof by nine Maximus Planudes (c 1300 A D) attributes the credit of invention of this ingenious method of checking arithmetical operations to the Hindus From an interpretation of certain expressions used by the celebrated Arab mathematician Avicenna in stating the rules for the verification of the square and the cube of a number, which we have quoted before, Woepcke has shown that Avicenna believed the proof by nine to be of Hindu origin Cantor, Tannery, Fink, Heath and other distinguished modern historians of mathematics are also of the same opinion But Kaye[3] and Carra de Vaux[4] think that the proof by nine did not originate in India, but in Arabia They have sought to thrust different interpretations on those two expressions and those have been the main stay of their contention against the Hindu origin of the proof. But as will be easily understood, these new interpretations alone can hardly be considered as sufficiently convincing proof in support of their hypothesis For, even if we assume their interpretations as correct, though they are in fact not, they can at most invalidate the testimony of Avicenna, but not that of Planudes What is there to contradict and

[1] *Vide* Delambre *Histoire de l'Astronomie Ancienne*, t 1, Paris 1817 pp 518 et sqq

[2] Behâ Eddin *Kholâsat al-hisâb*, French translation by A. Marre, *Nouvelles Annales d Math*, t v (1846) p. 263

[3] Kaye, *Indian Mathematics* p 34

[4] Carra de Vaux "Sur l'histoire de l'arithmétique arabe," *Bibl Math*, viii (2), p 33.

nullify the testimony of Maximus Planudes? It has been stated by Planudes that he derived his knowledge of Hindu mathematics from his Arab teachers The title of his book is *ψηφοφορία κατ' 'Ινδούς*, or *Arithmetic after the Indian Method*[1] and in it the Arabs are only little mentioned Hence it follows as a matter of course that the Arab mathematicians of the thirteenth century of the Christian era believed in the Hindu origin of the proof by nine And up till now nothing has been discovered to contract this belief of Maximus Planudes and his Arab masters. Hence we can still continue to attribute the credit for the invention of the proof by nine to the Hindus In one point we are, however, quite sure as Āryabhata II was anterior to Avicenna he could not have possibly borrowed from the latter

[1] This book was edited as *Das Rechenbuch des Maximus Planudes* in Greek by Gerhardt (Halle 1665) and in a German translation by H Waeschke (Halle, 1878)

The Indian Affinities of Ainu Pottery

By R. D. BANERJI.

In Japan the historical period begins at the end of the fifth century A D when the ancestors of the present Japanese peoples immigrated into the islands The aborigines of Japan are known as Ainus, which means men Up to the introduction of copper and iron the Ainus lived in the neolithic age Their habitations are marked by immense mounds of molluscs and bi-valves, along the coast of north eastern Japan Excavating among these shell mounds Dr T Takashima discovered numerous remnants of pottery of a peculiar type which has no analogies to Chalcolithic Chinese pottery Dr Takashima's collection has been purchased for his museum at Nagahama in Omi, by the Japanese merchant-prince Mr Dembei Shimogo The best collection of Ainu pottery is now to be seen in the Museum Shoshu-Kan founded by Mr Shimogo So far nothing was known in India of the form and texture of Japanese prehistoric pottery and its affinities were as much a sealed book to Archaeologists as Indian prehistoric pottery was four or five years ago On the occasion of the visit of the Crown Prince of Sweden to Japan in 1926 the choicest specimens of prehistoric Ainu pottery were described by Mr Kosaku Hamada of the Archaeological Institute, Imperial University of Kyoto in an illustrated brochure with a short foreword in English This brochure was brought to India by Mr T Shimogo, son of Mr Dembei Shimogo who was touring in India with Prof Kuroita, Professor of Japanese history in the Imperial University, Tokio, in November 1927 I am indebted to Prof Kuroita for an account of Japanese prehistoric pottery and Ainu culture and to Mr T Shimogo for a copy of the brochure and permission to reproduce the illustration

The points of affinity between Ainu pottery and that of India and Crete are three Three different types of vessels indicate a definite contact between the prehistoric pottery of Japan, India, Mesopotamia and the eastern Mediterranean islands The first and the earliest of these is the suspension-vessel The suspension vessel is a neolithic or perhaps even palaeolithic survival Its oldest form survives at the present day among the leather bottles of the Mongols and Kurds in which they carry curdled milk while on a long journey or churn butter or cream by tossing milk in these bottles on a blanket or net, Their use lingers at the present day in Central India and Rajputana where they are used for carrying water on long journeys

specially on camel's back Describing certain suspension vessels from the prehistoric tombs from Baluchistan in 1883 the late Dr John Anderson stated that suspension vessels of this type were made at that time at Erinpura in the Sirohi State and Rewa [1] At the present day vessels for carrying water are made either of metal or canvas by Rajputs while Muhammadans in certain cases only use thin leather for this purpose

The suspension vessel from Fukuda in the province of Hitachi to the immediate north of Tokyo was not intended to be used as a vessel for carrying liquids on a journey Its mouth is comparatively wider and it would have required an exceptionally large lid to stop its contents from spilling (pl 6, fig 1) It has moreover two series of three rings each on each side of its body. The shortness of the neck, the wideness of the mouth and its size indicate that it was used as a butter-churn It was suspended from the roof and was propelled from one side to the other Indian, Mesopotamian and Cretan suspension vessels fall into two different classes Suspension vessels from Mohenjo-daro and Harappa have either four rings or two rings for suspension Those with two rings are generally flat vessels like modern army-water-bottles and their shape indicates that they were used for the carriage of liquids on long and swift journeys, either on horse-back or on camel's back There is one exception, however to this rule In certain cases round miniature vessels with wider mouths also have two rings instead of four, Bn 52 is a fairly large and beautifully painted miniature vessel with a comparatively wide mouth but it has two rings for suspension [2] It could not have been intended for the carriage of liquids on a journey Other vessels of the same type and very nearly the same size, such as Bn 32 [3] from Damba Koh, and Bn 53 [4] from Chidizi are provided with four rings Bn 65 [5] from Gird Koh near Wank is a tumbler shaped vessel with a wide mouth but it has two small loops for suspension instead of four Regular water bottles were well known A miniature wine-cooler is almost of the same shape as a modern round flat metal water bottle (Bn 27) [6] Bn 28 is a glazed suspension bottle with two rings one on each side [7] These specimens show that the Indian suspension vessels were used for two purposes, for slinging bottles from the roof or from a peg and for the carriage of liquids on journeys Specimens

[1] *Catalogue and Handbook of the Archaeological Collections in the Indian Museum, pt II, p 446*

[2] *Ibid* *p* 449, See pl 8, fig 8 [3] *Ibid*, *p* 447, See pl 8, fig 6

[4] *Ibid*, *p* 450, See pl 6, fig 3. [5] *Ibid*, *p* 451-2 See pl 6, fig 2

[6] *Ibid*, *p.* 445-6, See pl 8, fig 8 From Damba Koh, 40 miles from Suktagen Dor

[7] *Ibid*, *p* 446, See pl 9, fig 9 Also from Damba Koh.

from Mohen-jo-daro and Harappa show that even small cups and saucers were provided with four rings or loops for the purpose of suspension Certain specimens discovered by me indicate that even very large jars were made for suspension In them a series of large thick rings round the middle served to pass a thick rope which prevented the weight of the liquid from crushing the vessel

The province of Hitachi in Japan is far away from the Indus valley and Baluchistan and no intermediate links are known to exist in Korea, Northern and Southern China The painted pottery from Ho-Nan in Central China is allied to pottery of the same class discovered at Mohen-jo-daro and Harappa but no suspension vessels have been described by Mr T J Arne in his monograph on "The painted stone age pottery from the Province of Ho-Nan" Further west, suspension vessels have been found at Musyan Susa and South Kurgan But the best preserved suspension vessels come from Crete, particularly, the ruins of Knossos Cretan suspension vessels of the subneolithic phase belong to two different varieties and resemble the Indian types. They are -(1) vessels with two rings and (2) vessels with four rings [1] The vessels with four rings are almost identical in shape with those discovered at different places of Baluchistan or Mohen-jo-daro or Harappa

The second specimen of Japanese prehistoric pottery which calls for remark is a vessel of a peculiar type I have heard from Sir John Marshall that these vessels are called "wine-coolers" He himself has discovered at least one of these vessels at Taxila [2] and one specimen from this place has recently been added to the archæological collection in the Indian Museum The Mockler collection contains "wine-coolers" of two different types The first type is a low vessel with a flat bottom and a round top, without any handle or an opening in the upper part [3] The second type is a perfectly round or elongated vase without any opening on the top The point of similarity between these two types are the absence of a neck or opening near the top and the presence of a spout on the side [4] The second type is a large pear-shaped vessel (Bn 26) In this specimen there is a ring-shaped handle on the top which is entirely closed except for a very small hole. The only avenue of ingress and egress is a short tapering spout on one side It is this particular specimen which calls for remark in comparison with Ainu pottery The specimen of this type in

[1] Sir Arthur Evans, *The Palace of Minos at Knossos, figs* 21-24

[2] *Annual Report Archæological Survey of India, 1920-21, pl XV, 17*

[3] Bn 26 from tombs at Jumi on the east side of the Bay of Gwadar Anderson, *Catalogue and Handbook. pt II. p* 445 See pl 9, fig 10

[4] *Ibid , p 445* from funeral Cairns at Gati six miles from Gwadar, See pl 9, fig. 11

the Museum Shoshu-Kan is exactly of the same shape, the only difference, being the presence of two ring shaped handles instead of one. The closed top is further guarded by a moulded ridge of clay joining the two rings on each side of the vessel. The specimen was discovered at Shitsuka, Takata, in Hitachi.[1] Such pottery, so far as my knowledge goes, has not been found by Pumpelly at Anau, Susa or Musyan. The type also seems to be totally unknown in south-western Asia or Crete.

The third specimen in the prehistoric collection of the Museum Shoshu-Kan came from Fukuda, Osuga in Hitachi. It is an exquisite little dove-shaped or goose-shaped drinking cup. It is an elongated vessel the handle of which is the head of the dove or the goose and the wings are indicated by incised lines. There is a round cavity on the back of the bird and its tail has been fashioned like a hollow tube or funnel.[2] Most probably liquid was drunk from these vessels through the hole in the tail and the contents of the vessel could be added to while a man was drinking out of it from the hole in the tail. Numerous bird-shaped vessels have been discovered at Mohen-jo-daro and Harappa, but most of them have not been recovered in good preservation. One or two specimens have also been found at north Kurgan but the only vessel which can compare with the Japanese specimen in beauty of shape and execution is the dove-vase of Knossos discovered by Sir Arthur Evans who supposes that it had some ritualistic use.[3]

These affinities between the prehistoric potteries of Japan, India, Mesopotamia, Central Asia and Crete prove that in the later phase of the neolithic period or the copper age there was direct communication between the people living along the eastern and the southern sea-board of Asia.

[1] See pl. 7, fig. 4. [2] See pl. 7, fig. 5.
[3] *The Palace of Minos at Knossos*, p. 146, fig. 107.

Fig. 1. Suspension vessel from Japan.
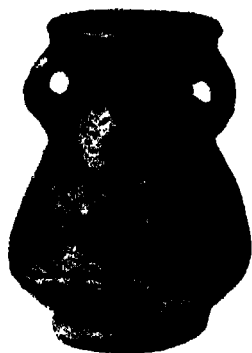
Fig. 2. Bs. 65. Glazed suspension vessel with two rings.

Fig. 3. Bs. 53. Painted miniature suspension vessel with four rings.

Fig. 4. Wine cooler from Shirtsuka [illegible] in Hitachi, Japan.
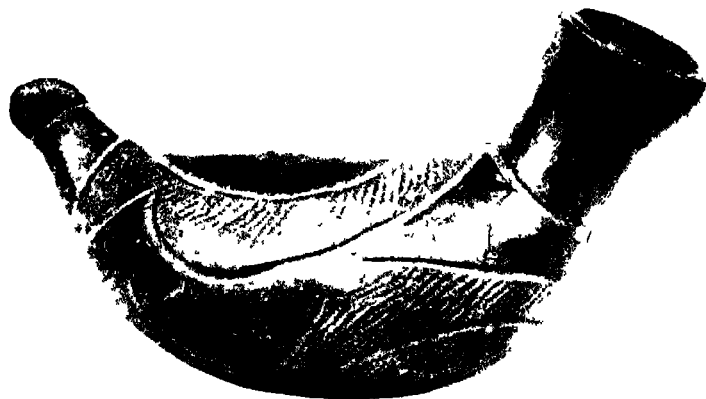
Fig. 5. Dove shaped drinking vessel from Fukuda, Osuga in Hitachi, Japan.
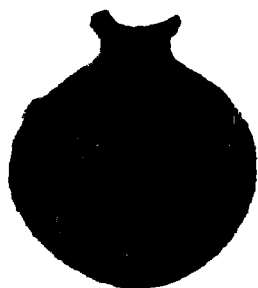
Fig 6 Bn 22, Plain suspension vessel with four rings
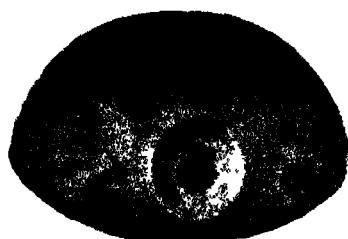
Fig 7 Bn 27 Miniature wine cooler.

Fig 8 Bn 52 Painted suspension vessel with two rings

Fig 9 Bx 28 Glazed suspension bottle

Fig. 10 Bx 26 Large wine cooler, type A

Fig 11 Bx 25, Large wine cooler, type B

Haramukh Legends.

BY MRS C. DE BEAUVOIR STOCKS

Like many other fertile plains and hills in Asia, the valleys of Kashmir were for long the source of a continuous struggle between different races, each one of them having their own religion and civilisation. The original population of Kashmir—chiefly composed of the Shina and Dard stocks—gave way to different invaders, the latest being Iranian and Turkish tribes, which brought Muhammadanism with them in the XIVth century. The struggle was fierce in those times, and probably is not entirely finished to this day.

It is evident, that in a place like Kashmir, overrun as it is, it would be difficult to look for genuine folklore preserving ancient beliefs in all their clearness. Only isolated temples are sometimes surrounded with legends which date from a remote antiquity, and these have a slightly changed garb, as they have passed from one religion to another. Usually these are found in connection with ruins of Hindu temples, of which, in Kashmir there are many. Most probably these legends were transmitted from much earlier religions, and belonged to races which have disappeared long ago, and were only absorbed by Hinduism later. It is a Hindu custom to collect and invent legends which will glorify the miracles and healing properties of the place of worship. Some temples have worked up these legends into the form of old holy books.[1] Indeed, the stories undergo many changes, and have, very often, little to do with the original version.

Such a cycle of legends are these relating to Haramukh[2] which hitherto, have not, I understand been rendered accessible to Western readers. Rising to a height of 16,903 feet[3] it is seen for many miles and is regarded as a holy mountain, as is also the Gungabal, one of the many adjacent lakes. Strangely enough my informer was a Muhammadan, a Gujar or shepherd, called Juma Khan. This is an incident of some value, because though the general trend of the legends comes undoubtedly from a Hindu source, they could not have been taken directly from religious literature. It can be supposed that they are founded

[1] These kinds of legends have a special term, the *mahatmya*.

[2] The early Sanskrit name was Haramukuta, cf. Kalhana's *Rajatarangini* transl. by Sir M. A. Stein (Westminster 1900, 2 vols), v. I p. 20.

[3] Lawrence, *The Valley of Kashmir*, p. 14.

chiefly on local tradition, but owing to the Hindu worship in these holy localities, have been subjected to considerable Indian influence

The legends were recorded by me through an interpreter during my visit to Haramukh in July 1927, while at Naranag and Tronkol. The latter place is not far from Gungabal

Naranag or Naran-nag[1] is the place from which the pilgrims' steep path commences, and is where the group of ruined temples lie, and used to be connected with the worship of Siva. They are called Rujdainbal and Nagbal, and current with the belief that is everywhere connected with ancient ruins, vast treasures are supposed to lie hidden within its walls In fact it is well known, that ill luck pursues him who attempts through a thorough search to make the temples give up their riches.

The tank[2] fourteen feet long also deserves mention at Naranag, being carved from one piece of stone To conclude I will quote the late Doctor E F Neve's words from his 'Tourist Guide to Kashmir and Ladakh'—'Trees have overgrown and almost completely buried several of the smaller temples On the summit of the largest, a tall pine tree has taken root which rises straight from the centre in rivalry of the original finial The architecture is of a slightly more advanced type than that at Payech in Eastern Kashmir, the most striking feature being the bold projection and lofty trefoiled arches of the lateral '

Many years ago, a king called Bekal-singh[3] lived on the mountain called Mahyn One day, he went out shooting, taking with him, one hundred and twenty-five sipahi

Now when they had travelled for two days, they came to the foot of the high mountain Isiak There they spent the night, but later a fearful storm arose causing a wide landslip, for many miles, and part of it, falling on the soldiers crushed them to death. The king alone escaped, but feeling too sad to return to his palace, he walked on

After walking for two days, he met a holy man praying on a hill, and crying out loud, the holy man asked him why he was so sorrowful The king told him of the loss of all his men, and taking the holy man's advice, he decided to live on the hill with him, first returning to fetch his three sons and one daughter, whom the holy man would teach as no one else could, so famous was he for his knowledge. The king told him to

[1] Details of the history of this temple are given in Sir M. A Stein's work, *ibid*, v, I. p 20, note to the 107th *sloka*

[2] Cf *ibid*, vol II, p 112

[3] This is the name I made out from my informer's pronunciation Probably it should be *Beytal-Singh* the demon who is so popular in Indian folklore

instruct them as royal children, for one day, the boys would be the kings of three countries, while his daughter would be the queen of another country. Now the eldest boy's name was Hari Singh, which was changed to Haramukh, the second one was called Nanga Singh which was altered to Nangapar,[1] while the third one was named Kurd-Singh which was changed to Kasinagh (a land that lies near the Lolab valley). The king's daughter was called Braynd, and she was named Bring[2] after a country near Jammu.

Soon after this, the eldest son came to a place that seemed suitable to build on, while he created the Mount Haramuk, and made one big lake and two smaller ones These were called Gungabal, Nandakol and Lulgulnag. Then he built a small hill naming it Dandider, (or Dandiya-market)? which hold all his corn, grain and rice Here he lived as a king, at last becoming a holy man and making his wazir act as a king for him. He died fourteen years later, leaving three sons Soon after a ruler came from a far-distant land, fighting and killing all his sons and men Now it so happened that the King's priest had charge of the hill Dandider, and the victorious king became hungry fighting, and finding the priest begged some food for his men and himself. This the priest refused and as he prayed to God the hill turned into mud and stone, but retained its form as a store-house (This is shown up to the present day) Then the priest himself jumped into the Nandakol Lake, and all the triumphant soldiers were so amazed and alarmed at the strange happenings in that astonishing land that they fled back into their own country

Then the Nandakol Lake was left alone for several thousand years The first man to come next was a king from Gujrat He built a palace at Haramuk, but no trace of it can be seen to-day Soon after, another ruler being envious of the palace near the mountain came down, and waging war, killed the king with all his men He lived there for several years, but never believed the story that he so often heard about the first king's son having created the lake, neither did he believe about the priest having drowned himself in it One day, a fearful storm arose, which drove snow and ice down from the top of Haramuk and killed this unbelieving king with all his sons, his soldiers and his servants From that day, snow can always be seen on the mountain all through the summer, and no king lives there now to disturb its solitude

Now Nangapar, the second son (of the first king), became a holy man, and created the mountain Nangapar which was so called after him. But the third son, Kasinagh, studied hard with the priest who taught him the magic of blowing on his

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[1] Is this Nanga-Parvat, the famous mountain?

[2] A river and district near Achabal, Bring Cf. *ibid.* Vol. M. p. 468

chest three times and wishing Then whatever he wanted—from a mountain down to a horse, he had. Kasinagh was told there was no water in the Lolab valley He made the magic sign with three sticks, and blowing on them, he made water But the water had come from the land of the Jogi, which land had now therefore run dry A wizard dreamt that Kasinagh had deprived them of their water, and catching him in the valley, he asked him why he had done this. He was very angry, and turning him into a snake, the wizard put him in his bag and returned to his own country

There he felt very hungry and thirsty, and eat lots of fruit, though he was unable to quench his thirst as there was still no water. Then he hung his bag on the branch of a tree, and went to sleep underneath But an old woman passing, thought she would like to see what it was the old wizard had in his bag As she opened it, the snake jumped out, and found his way to a place called Hamal,[1] which is near the Lolab valley The old woman followed, and turning, the snake spoke to her It told her that if she wanted water, she was to dip a stick in the river Then she was to run home dragging the stick after her never letting it leave the ground It would then create a river in its trail. The wizard woke up to the sound of rushing water and wept as he had not found any He returned to Kasinagh and asked who had let him out of the bag. But Kasinagh in answer said, Unless you leave me at once, I will kill you They started fighting, and it went on for seven days, but the old wizard refused to stop, until Kasinagh had promised him some water At last, his enemy promised him some, and consented to live for six months of the year in Jogi and the remainder in the Lolab

The holy man then asked the king's daughter whether she would like to get married or not Replying that she would rather remain single as she was, he told her to go to the land of Poonch There was no water there, and she was told to scrape on the ground in a curve with a stick, which movement would produce some Brynd did this, thus creating many rivers with a large lake which was named the Lorun Sat [2]

Calcutta. April 1928

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[1] The Hamal district Cf *ibid* vol II, p 293

[2] Lolau ? Ancient ruins of that name are found in the Lohorin valley.

Some of the Worship Festivals of the Hos of Kolhan.

By D. N. MAJUMDAR

As many as seven important worship festivals are observed in Kolhan besides a number of minor ceremonies at regular intervals; Maghe in January and February, Baha in March and April; Damurai in May; Hero in June, Bahtauli in July, Jamnama in August and Kalam in August and September In Seraikhela and other Feudatory States in Orissa, where the Hos live in close association with the Oriya speaking people some of the latter's festivals have been absorbed by the Hos The Oriyas also are seen to join in Ho festivals but they are not allowed to take part in Ho dances In Ho dance, men and women are seen to mix together freely and enjoy each others company. As the Hos do not allow members of other tribes to enter into matrimonial alliances within their tribe, it is no wonder that they deliberately refuse to dance with the Oriyas Dances as a rule afford unrestrained mirth to the people and association with others in dances with whom marital relations are tabued may lead to undesirable complications

The Hos have no fixed date on which the festivals are to be celebrated, the ceremonies depending on the economic condition of the villagers When their granaries are full and they are free from outside engagements they meet together in the house of the Deuri or priest who appoints a day for its celebration Each village decides for itself, so that a particular ceremony extends over a long period, say a couple of months, in Kolhan This is generally the case with Maghe and Baha festivals The Hos possess no priest-caste among them, the village Deuri who is a member of the tribe and who is entrusted with their religious and sacredotal functions, is more or less a village official and is appointed for his special proficiency in the sacred lore of the tribe. The office is not absolutely hereditary, but generally the Deuriship goes to the family of the Deuri. The eldest son inherits the office of the father. I have seen a case in which the eldest son was a minor, but was allowed to officiate as the Deuri while his paternal uncle cited the hymns and formulas in the Maghe festival, which to all intents and purposes is regarded as the most important 'parav' of the Hos

The principal festival of the Hos is the Maghe which is held in January and February As regards the significance of the word 'Maghe' opinions differ. The Mundas and other cognate tribes of the Chota Nagpur plateau also have this festival Mr Roy has explained it by referring it to the Bengali month

'Magh' As it is held in the month of 'Magh' the festival is known as 'Maghe.' Some are of opinion that as this festival is held in honour of spirits whose bodies were devoured by animals (i e. Magia Bongas) it is styled 'Maghe Festival' Although the Hos who are in touch with their urban neighbours, always try to misrepresent facts fearing lest their cultured neighbours will speak lightly of them, the people in the interior are to some extent free from this vice, and I have seen that straight questions put to them, have elicited the right answer It appears from enquiries made in different quarters, that the term 'Maghi' is not the same as 'মাঘী' in Bengali, but is used to mean the procreative power of young men Whether the latter significance is an after-thought or the general sexual liberty enjoyed by the people during the festival has suggested such an association that remains to be ascertained But whenever I approached the people to have my doubts cleared regarding the use of the word, I was given an evasive answer and it was with much difficulty I could arrive at the present significance Nor does it require any long stretch of imagination to arrive at such an explanation of the word for it is always after the celebration of the 'Maghe' festival that marriages are settled and the Hos believe that if they do not indulge heart and soul during the festival, the number of births in the tribe is sure to decrease

Every village has to celebrate this festival. Should any village fail to do it, it is sure to be doomed, the villagers are cursed and there is no hope for them For Dessauli Bonga sends diseases and famines to the village, rats to devour the grains and epidemics to sweep away the villagers If any individual refrains from taking part in the ceremony, his fate is sealed, his crops are sure to be damaged, members of his family must die or be devoured by wild animals. Such is the strong belief of the Hos, that there is hardly any absentee People working in remote parts must come back to their respective villages during the festival to take part in it The absence of any fixed date for the celebration of the festival, accounts for much inconvenience to Ho labourers whose field of work may lie miles away and to young men who are tempted to participate in it in different villages. The festivals of the Hos afford unrestrained mirth and dalliance and these are baits enough to tempt the young men from neighbouring villages The pernicious effects of the prevalent system of celebrating the festival in Kolhan have called for direct action on the part of Ho leaders and the precautionary measures adopted by them are commendable [1]

The ritual portion of the festival extends over five consecutive days and on all the days except the last the villagers with

[1] Modern Review, March, 1925 Author's article on Social Reform

the Deuri at their head offer *Pujas* and sacrifices to the village deity or Dessauli Bonga. Offerings of 'handia' and sacrifices of fowls and 'bodas' or he-goats to 'oa' or 'wagoi' Bongas (family spirits) are obligatory on every occasion

The following functions are attended to —

(1) 1st day. Gawmara.
(2) 2nd day Ote-illi.
(3) 3rd day Loyo
(4) 4th day. 'Marang parav'
(5) 5th day Basi or Bonga Haur

Gawmara —When the villagers get ready for the festival they meet at the house of the Deuri, where they decide upon a date for the celebration Every Ho village is self-sufficient It contains a family or two of Tantis' or weavers who supply coarse clothes to the Hos, one or two families of 'Lohar' or Blacksmiths, and a few families of 'Gaw' or cowmen These belong to the lowest strata of Hindu society and mostly imported to be of service to the Ho population. They are generally paid for their services in kind, and in no case are allowed to hold lands for cultivation The Gaw' tends the cattle of the village The Hos do not milk their cows, for the milk belongs to the calves, and to deprive them of it, is, in their opinion, tantamount to depriving a child of its mother's milk Besides, the Hos consider it derogatory, if not beneath their dignity, to tend their cattle, so the 'Gaw' is appointed to look after the animals, for the Hos require them only for ploughing and preparing the soil. Now when the date for the ceremony arrives, the village Gaw' is summoned to the house of the Deuri who instructs him about the paraphernalia required for the festival On the morning of the first day of celebration, the villagers assemble in the courtyard of the Deuri, with offerings of heaps of grass known as 'Saiu' and 'Bunum' which are placed on the spot rinsed with cowdung solution After a clean bath with an empty stomach and a clean and white 'botoi' on, the Deuri takes his seat in front of the heaps of grass and worships the prominent Bongas of Ho pantheon beginning with Dessauli As soon as the worship is finished, the 'Gaw' is called upon to scatter the grass with his head imitating the ways of the cattle which he tends The villagers then come back to their respective houses where they offer 'handia' and sacrifice fowls to 'oa' or 'wagoi' Bongas or ancestral spirits. The rest of the day passes in dance and animated revelry in the village 'akhara'

Ote-illi —On the second day, the Deuri offers 'illi' or rice-beer to the Bongas The villagers come with pots full of 'illi' or rice-beer. The Deuri and his wife sit together in the courtyard, each with a cup made of sâl leaves in hand and two of the villagers approach the couple to pour the liquor

from the pots to the leaf cups The first man pours the liquor into the Deuri's cup and the next into that of the Deuri's wife The Deuri mutters some incantations and then pours down the contents on the ground The wife follows suit Next, the two villagers change places and the first man pours liquor into the cup of the Deuri's wife while the second man fills up the cup of the Deuri This time also the liquor is dropped down. The process is thus repeated seven times, each man giving the liquor alternately to Deuri and his wife The seventh time being over, Deuri and his wife drop down the leaf-cups and leave the place amidst loud cheers and 'hullah' of the villagers The remaining liquor is then distributed amongst all present, who cheered with the intoxicating drink, set up a dance at the village 'akhara' which is continued till late hours at night

Loyo —There is no general 'puja' or sacrifice this day The villagers observe it as a purificatory day, preparatory to the Marang festival, the principal function of the Maghe festival. Every house is swept clean, the floors and courtyards rinsed with cowdung solution and the villagers take a purificatory bath in the neighbouring river or tank as the case may be On their return to their respective homes light cowdung solution is sprinkled on their heads and on all the articles of domestic use After the ceremonial bath, villagers may offer sacrifices to the 'oa' or 'wagoi' Bongas, if they had promised to do so during illness or for any social or agrarian troubles that might have occurred in the preceding year The rest of the villagers pass the time in frivolous jollities

The fourth day is set apart for the celebration of the Marang Parav,' which is the main function of the festival The Deuri has to fast all day and is not allowed to take anything except some quantity of rice-beer which is a drink of the Hos Generally speaking, he does not touch rice-beer even. The ceremony begins from the afternoon, when the villagers accompany the Deuri to the village 'baudh' or river, where the latter takes a ceremonial bath amidst deafening cheers and 'hullah' of the villagers, and the drums playing all the time The place of worship is always outside the limits of the village, at the crossing of two or more village alleys, where a raised platform has already been erected the day before The Deuri is then conducted by the villagers to this place of worship after his ceremonial bath to invoke the 'Dessauli Bonga' and to offer sacrifices The villagers take with them one large pot containing rice-beer a pot full of water, some leaf cups, one red cock and two hens The Deuri first places a piece of bark which they call 'lama' and an 'Icha' twig with blossoms, which they call 'ichabah' with the chanting of some formulas, most of which are corrupt 'patois' consisting of obscene utterances and are supposed to please the Dessauli

Bonga The Deuri then pours rice-beer into the leaf cups, and scatters some 'arua' rice on the ground and taking hold of the cock utters the same incantations again After each repetition of the hymns, the Deuri places the cock on the ground so as to enable it to eat the grains scattered and the villagers about four or five in number assist the Deuri in blowing horns of buffaloes each time the cock partakes of the grains The process is repeated seven times, when the cock is killed by the Deuri amidst deafening sounds of horns The fresh blood is poured on the ground in front of the Deuri and the cock thrown aside.

Next the Deuri takes the hen and chants the incantations and after the seventh repetition the hen is likewise killed and offered to the 'Nage Bonga' As the 'Nage Bonga' is a female spirit a cock cannot be offered to her The blood is sprinkled on the ground and the body put aside Lastly the Deuri takes the second hen and offers it to 'Buru Bonga' and other spirits of the forest, this time, however, the hen is not sacrificed by the Deuri, who throws it away after citing the hymns, when the villagers kill it each throwing a stone at the poor creature, thus affording cruel sport to the gathering The Deuri then sprinkles water on the cock and the hen and the villagers who assisted the Deuri take them to the Deuri's house, where these are cooked and eaten by the Deuri and his helpmates The rest of the villagers then retire to the village 'akhara' where the dance is in full swing and join with the party The hen killed by the villagers is the spoil of the village Dom

The songs sung on the occasion are either serious or obscene The obscene ones are fouler than language can express An example of the latter is the attempt of male dancers to describe the female organ while the female dancers describe the male organ They will tell you that unless the villagers indulge in these vulgar songs, calamities worse than death are sure to fall on them, the Bongas would get displeased and in their wrath cause all sorts of diseases and epidemics to chastise the villagers The underlying motive of this particular custom seems to be something else for we know that the Oraons also perform certain magico-religious observances to augment the procreative power of the tribe A slit is made on the central pivot of a dormitory house, and the boys are required to press their generative organ into this with the belief that this magical observance will increase the procreative power of the young men of the tribe So the description of sex organs too may mean a device for augmentation of the generative power of the tribe, for we know, amongst the Hos during festivals men and women mix freely and great strain is exercised on the laws of decorum. Sexual license before marriage, though not tacitly recognised, is prevalent amongst the Hos, and a girl does not suffer on account of any intrigue

before her marriage. Practically there are no social laws forbidding a young man to enter into much intimacy with a girl of a neighbouring village—unless the intimacy is carried to the extreme and an issue is apprehended In such case the girl's parents will force the young man to marry the girl, or bribe some other young man to marry her.

The fifth day witnesses a typical ceremony known as the 'Basi' or the 'Bonga hanr' or the expulsion of the spirits Like the 'Bisarjan' ceremony of Hindus, performed on the 4th day of the 'Durga Puja' when the Goddess 'Durga' with all her company is commuted to the river, the Hos also drive away the spirits on the fifth day of the festival

The function is called 'Basi' or the end The villagers armed with sticks, four to five cubits long, come out in batches of ten to twelve and begin hunting the spirits with vociferous songs and incantations unintelligible to the villagers themselves They assemble at the boundary line of the village and begin by singing or rather chanting their invocations in singsong tune and run in zigzag way till one of them shows signs of being possessed with a spirit and points out a spot which is accepted by the villagers as the haunt of the spirits The possessed man runs with the villagers at his heels on to a big tree or 'jungle near by and addresses the spirits thus —

We have brought you here
We want you to stay here
Please take up your abode on the tree

With these words they return to the village Thus finishes the great 'Maghe' festival of the Hos

Baha Festival :—Baha means flower and 'Baha parav' is the flower festival of the Hos It is held early in Spring between March and April when the Sâl tree blossoms. Nature wears a flowery garment and like a newly wedded bride she appears with all her freshness and charms. The primitive mind marvels at this mystic and wonderful aspect of Nature, and the surprise that makes him to approach her with all the reverence of a devotee, induces him to place his choicest presents at her sacred altar. Nature is believed to be the bride of 'Sing Bonga' and the divine marriage is consummated by universal rejoicings and offering Pujas and sacrifices to the 'Dessauli' The divine marriage is also regarded as the symbol of fertility. The Mundas and the Oraons also celebrate this divine marriage and all their marriages are held after the consummation of the divine marriage The Hos also do not allow any wedding before the 'Baha' festival. The explanation of this divine nuptial may be gathered from the following extract from Dr Frazer's Golden Bough (Abridged Edition, p. 142)

"At Athens, the god of the vine, Dionysus was annually

married to the queen, and it appears that the consummation of this divine marriage as well as the espousals was enacted at the ceremony but whether the part of the god was played by a man or an image we do not know We learn from Aristotle that the ceremony took place in the old official residence of the king, known as the cattle stall which stood near the Prytaneum or Townhall on the north-eastern slope of the Acropoles The object of the marriage can hardly have been any other than that of ensuring the fertility of the vines and other fruit trees of which Dionysus was the god Thus both in form and in meaning the ceremony would answer to the nuptials of the king and queen in May "

Again, in the same work we find, "Every year about the middle of March when the season for fishing with the dragnet began the Algonquins and Hurons married their nets to two young girls aged six or seven The reason for choosing the brides so young was to make surer that they were virgins They did so and the fishing turned out all that could be wished "

The illustrations cited above make it clear that these fanciful and dramatic nuptials are intended as a magical device to augment the fertility of the vines or fruit trees or to ensure success of the fishing season The same may be held with regard to the divine marriage of the primitive tribes who also intend to ensure the fecundity of the tribe

The festival extends over two consecutive days The first day is known as 'Bagurugiti' Every village possesses a big tree or hill near by which is regarded as the abode of the 'Dessauli Bonga' and the villagers with the Deuri at the head approach the abode of the Bonga with a basketful of cowdung A particular spot is selected under the tree or at the foot of the hill which the Deuri sweeps and plasters over with cowdung He then promises to the Dessauli Bonga' that he would come the next morning with offerings and the party retire to the village The Deuri fasts all day and is only allowed to drink small quantity of rice-beer At about 10 A M next morning the Puja begins The male members of the village with the Deuri go to the appointed place where the Dessauli is worshipped with great eclat The villagers place heaps of Sâl flowers on the spot, sprinkled with cowdung solution A cock is also taken for sacrifice First the Deuri offers the flowers to the Dessauli with incantations :—

> Tising deo bahaparav hamoko dumoko
> Mera kula mera bing buru horare
> Gara horare sitia betiako bugite kotauko
> Mera boasu mera laiasu
>
> * * * * * * *
>
> Baha subarer sebametanai saramtanai
> Parjako paikiko merako laihasua, merako bohasua
> Bugiakan napaikan gekako

Then the cock is taken by the Deuri and as in the 'Marang Parav,' some grains of 'arua rice' are scattered on the ground. The Deuri utters incantations in honor of the Dessauli and after each such incantation the cock is placed on the ground to enable it to partake of the scattered grains. This is repeated seven times when the cock is killed by the Deuri

Next the Deuri has to cook the sacrificed cock and some 'arua' rice on the spot When the cooking is finished the Deuri's wife goes to the spot and stirs the contents of the pots with a ladle. The number of stirrings is limited by the number of times the Deuri walks round the spot citing incantations as he moves

The Deuri then distributes the flowers amongst the villagers who rally around him to receive them The flowers are made to hang freely from the thatch of every house in the village, and it is believed, that the flowers possess the power to drive away diseases and epidemics

The party then retire to the village where the women expect them For it is the custom in Baha festival not to cook food before the people return from the Puja.' With the exception of 'handia' the villagers male and female do not touch any food. On return from the place of worship the villagers propitiate the 'Oa Bongas in their respective houses with rice 'handia' cocks or he-goats as promised during the year This being finished the women cook their food and men and women sit together for the breakfast

Maidens deck themselves with floral wreaths and like angels tread lightly up and down the village attracting notice of the young men who come from all parts of Kolhan to enjoy the festival This is the time for mutual selection, and young people desirous of matrimony make the best use of the occasion And as a result of this many matches are consummated after the Baha festival

Early in July when the fields are ready for cultivation and seeds are to be sown, the villagers observe a festival known as Hero-Parav This time also the presiding deity of the village, i e the 'Dessauli Bonga' is worshipped with offerings of handia, he-goat, etc. The first day is known as 'gurugiti,' when the villagers select a spot each in his respective field and besmear it with cowdung When the spot is thus rinsed, each villager places three sticks tied together with ropes made of 'Babui' plant and cover the sticks with thorns to protect these from the cattle. The villagers vow to the 'Dessauli Bonga' saying that they will offer sacrifices and pujas next morning

The next day at 11 A M, the villagers accompany the Deuri to his field where he worships the Dessauli with sacrifices of 'Bodas' or he-goats and offerings of 'handia' Then they go to their respective fields and worship the Dessauli separately

with offerings that they can afford to, after which they return to the village. In the evening each villager prepares bread or 'chapai' in his house and consecrate a portion to 'Oa' or 'Wagoi' Bongas after which they sit down together for the meals.

The Use of Nose Ornaments in India.[1]

By K N. CHATTERJEE.

(Communicated by Dr B S Guha)

A comparative study of ornaments and modes of ornamentation, ancient and modern, shows many striking changes that have taken place in this country during the passage of centuries

Amongst others the use of nose ornaments may be cited as a prominent case in point, for, although this particular class of ornaments is now in almost universal use all over India, it can be definitely proved that it is foreign in origin and of comparatively recent introduction

In a study of the antiquity of types of ornament in India, one has perforce to fall back on secondary evidence, due to the fact that, unlike Egypt, very few actual finds have been made of ancient hoards of ornament and treasure It may be remarked in passing that amongst these few finds of antique jewellery not a single article can be definitely said to be a nose ornament

The secondary evidence referred to above may be divided into two sections, namely —

1st Evidence of visual representation such as sculpture, painting, frescoes, etc , from historical monuments and temples

2nd Evidence in Literature

I will first put forward the results of the investigation of the evidence in pictorial and plastic arts

I started with the Barhut stupa remains in the Indian Museum of this city, because the figures cut in relief are in good preservation and a profusion of jewellery of many types and varieties are represented therein The number of male and female characters depicted is very large and they represent all classes A minute examination failed to show a single nose ornament In confirmation of my findings I may quote Cunningham's remarks in his monograph on the Stupa of Barhut, p 34

"There are no nose rings and I may note here that I have not observed the use of this hideous disfigurement in any ancient sculptures "

Next came Sanchi I have to confess here that my search in this case was conducted by means of photographs of the

[1] Read before the Anthropological Section of the Indian Science Congress held in Calcutta, January 1928

Archaeological Survey of India and not by examination in situ. However, here also I found no nose ornament.

Similarly, the sculptural remains at Bodh Gaya, Amaravati, Udaigiri, Sarnath, Badami, Ellora, Elephanta and the Orissa temples at Bhubaneswar and Konark were studied by means of the photograph albums of the Archaeological Survey and from the illustrations in the various memoirs, monographs and histories of art, such as those by Fergusson Cunningham, Burgess, Vincent Smith and Coomaraswamy.

A prolonged and careful search showed that nose ornaments were absent in all these photographs and drawings, and the same was the case with regard to the reproductions of the collections of ancient and mediaeval Indian sculptures in the museums of this country and abroad

During a recent tour in the States of Udaipur and Jaipur in Rajputana I carefully examined the sculptures on the temples and monuments at Eklingarh, Chittor and Amber I was not able to find a single instance of a nose ornament even in the Jagat Siromani temple of Amber which is reputed to have been built by Raja Mansingh, the great general of Akbar.

Further I may say that I have carefully searched the statuary and other sculptural work on view in the archaeological galleries of the Indian Museum Nose ornaments are conspicuous by their absence there, too

The sculptural remains mentioned above cover a period starting from about the 2nd century B C to the sixteenth century of the present era

The only instance that I have been able to find of nose ornaments being shown in plastic work is in the Pudu Mandapam of the great temple at Madura where the statues of the queens of Tirumal Naik are shown with nose ornaments. These sculptures were executed during the 17th century and therefore may be considered to be fairly recent.

Beyond the limits of present-day India, there are the immense and fairly well-preserved sculptural remains of Borobudur and Prambanam at Java It is, I believe, fairly certain that these works were executed under Indian direction and the inspiration and technique are typical of Ancient India

I have examined a fairly complete set of excellent photographs of these places and also the splendid reproductions in Krom's Borobudur There also the nose ornament is absent

Turning to pictorial evidence we have the Frescoes (or as Sir John Marshall says, tempera paintings) at Ajanta and Bagh in India and Sigiriya in Ceylon

I have very carefully gone through the reproductions in Griffith's and Lady Herringham's books on Ajanta and the recent publication of the India Society on the cave temples at Bagh. They do not contain any representation of nose ornaments In confirmation with regard to Ajanta I may

quote Griffith. "The nose ring nowhere appears." Griffith's Ajanta Vol 1, p. 16.

Similarly, nose ornaments are absent in the few drawings I have seen of Sigiriya frescoes.

Going further afield, I may mention that the reproductions of the paintings in the cave temples of Tun Huang, published by Sir Aurel Stein in his "Thousand Buddhas," do not seem to contain any nose ornaments either

Coming to Indian paintings in general the earliest representation of nose ornaments that I have seen are in the reproductions of some illustrated Gujrati manuscripts, reputed to date back to the 15th century, in Coomaraswamy's History of Indian and Indonesian Art I have myself seen several such manuscripts in some private collections, though they are not so old, and they undoubtedly do show nose ornaments

In striking contrast to the above are the illustrations in the Razm Namah in the Jeypore State library This book was written and illustrated by the order of the Emperor Akbar I do not remember having seen any nose ornaments in any of the illustrations, although it must be said that I had no chance of carefully going through them In any case, several of those pictures have been reproduced in the Journal of Indian Art and elsewhere, and in these the female characters depicted have not been shown with nose ornaments, although profusely adorned with jewellery otherwise

Later paintings show nose ornaments as a rule, although a painting depicting the marriage procession of Prince Khurrum (later the Emperor Shah Jehan) shows a troupe of female musicians not one of whom has any nose ornament

Next comes the question of evidence in literature I have to start here with a confession that my knowledge of Sanskrit being very poor, I have had to rely upon the authority of others

I have myself only gone through Arthashastra and Amarakosha Arthashastra contains a detailed account of the stringing of pearls and precious stones together with the uses of the same for personal adornment. Various parts of the body and head are described as being the seats of ornaments, but the nose is excluded, although, as is well known, of all gems the pearl is most commonly used in nose ornaments. Amarakosha gives a fairly big list of ornaments in use in India at that period but no mention is made of nose ornaments.

In a paper, which deals with literary evidence only, on the question of the nose ring as an Indian ornament published in the *J.P.A.S.B.* (N S.) Vol XIX. Mr N. B Divatia, B.A , C S makes the definite statement that neither the Sanskrit lexicons nor the general literature contains any reference to the nose ring

Prof Jogesh Chandra Ray Vidyanidhi, the well known lexicographer and Sanskrit scholar, in an article of his published in the Bengali periodical "Prabasi" Vol. 27, part 2, No. 1, mentions that he has failed to find the name of a single nose ornament in Sanskrit literature, thereby confirming my views on the subject as expressed in an article published previously in the same journal

Both the authorities quoted above agree that the present-day Indian names of such ornaments are of non-Sanskritic origin Indeed Mr Divatia quotes from two Persian lexicons, Asaf-ul-lugat, and Gayas-ul-lugat, which give Persian names of nose ornaments together with the statement that such names are of Turkish derivation

From what has been stated above, I hope my contention that nose ornaments are non-Indian in origin and were unknown here up to the early mediaeval period has been amply substantiated.

Next comes the question as to the source from which such ornaments were introduced into India

Mr Divatia contends that sincet he present-day Indian names of this class of ornaments are Mohammedan in origin, and further since De Quincey in his "Toilette of the Hebrew lady" mentions that nose ornaments were in vogue amongst the Hebrews and the Midianites, it can be taken for granted that nose ornaments were introduced by the Mohammedan invaders and that they originated in the Mohammedan countries abroad

I personally cannot make any definite statement in this matter, excepting that everything points to the introduction of nose ornaments by the Mohammedan invaders, inasmuch as they appeared in India after the Mohammedan invasion and the use of such trinkets became widespread with the expansion of Mohammedan power here

As regards the origin in Mohammedan countries I am not so certain I failed to find a single illustration of any such ornament amongst hundreds of excellent reproductions of any plastic and pictorial art from the ancient monuments of Egypt, Phoenicia, Babylonia, Assyria and Ancient Persia

It is true that the nose jewel "Nezem" was in use amongst the Hebrews, as we find mention of it in the Bible in several places, such as amongst the presents given to Rebecca by Abraham's servant (Gen. XXIV 22, 47) and in Ezekiel (XVI 12) "a jewel for her nose" etc But still that does not explain the absence of such ornaments from the pictorial and plastic representations. The ornament was probably like our Laung, Phuli or Nakchhabi and not the Besar, Bulak or Nath which entails piercing of the septum

It may be that a particular group of Semitic tribes were in the habit of using nose ornaments

Nose ornaments of various kinds are in use at the present time in Egypt, Syria and a few other countries inhabited by a Mohammedan population. The solitary pictorial evidence that I have so far found to prove that nose ornaments were used by Mohammedans in the early mediaeval period, lies in a painting by Shapur, the famous Persian painter, depicting a dancing scene at the court of Mohammad Tughlak. All the dancing girls, whose costume head dress and features are foreign and Mohammedan, wear nose ornaments Otherwise the Persian, Arabic and Turkish paintings as in Martin's collection, do not show this ornament

That other peoples besides those of India, who came in contact with the Semitic Mohammedan civilization also adopted nose ornaments is seen from the following description of the dress and ornaments of a particular Tartar tribe in a book named "The Costumes of the Russian Empire" published in 1803 Similar details of many other Tartar tribes are also given but with regard to this particular one, the Nogai the description contains the following extraordinary statement

"And some of them even pass through the nostrils a ring loaded with pearls and valuable stones which descends as low as the mouth this strange ornament is not uncommon to the females of Astrakhan and is generally worn by all those who dwell on the borders of Akhtouba" (i e the Persian border)

In describing their occupation the book further says "they carry on an extensive commerce with the Armenians, Persians and Boukharians" which shows their points of contact with the Mohammedan civilization The ornament described resembles our Nath It would be interesting to find out the history of this article in that locality

In case it could be proved that the use of nose ornaments was absent or fairly scarce amongst such peoples of India as did not come much in contact with the Mohammedan civilization by virtue of their places of habitat being either difficult of access during the Mohammedan suzerainty or being situated beyond the reaches of Mohammedan conquest, then a further proof of the Mohammedan medium of introduction of these articles would be established Unfortunately I have not been able to go very far in this matter for want of ready reference Still I may mention the following facts for all they are worth

In the monograph on Birhors (by Mr S C. Roy) it is stated that that tribe does not use nose ornaments The Birhors live in a country that was particularly out of the way prior to the introduction of railways.

In Mr A K Iyer's monograph on "The Cochin tribes and castes" the descriptions of the dress and ornaments of the various tribes are commendably complete and the book contains some excellent reproductions of photographs In the following descriptive accounts and photographs no nose ornament is in

evidence, although elsewhere they have been both described and pictorially depicted:

Pulayans—Photograph of a group of seven females and description.

Kaniyan—Photograph of a group

Valan—Photograph of a group of 12 females and description.

Indeed it may be said that nose ornaments do not seem to be much in use amongst the tribes and castes described in Vol I of that treatise and amongst the fishing tribes described in Vol II These tribes are mostly forest dwellers or fishing peoples of the coast, that is to say, the segregated peoples of a country that lay beyond the precincts of the Mohammedan empires and kingdoms.

Thurston's treatise on the castes and tribes of Southern India is not so complete as Mr Iyer's book with regard to the description of dress and ornaments but still from what there is in that work it seems that the Kanikars and Todas do not use nose ornaments to any appreciable extent. In the case of the Kadir tribe it is distinctly mentioned that the males have their noses pierced and stopped with pieces of wood No nose ornaments are mentioned in the case of the females, neither does the photographic reproduction show it

Apart from such isolated groups it may be said that nose ornaments are in general use throughout present-day India proper, although there are signs of its falling in disfavour in the more cultured and advanced sections of society

To sum up, it seems quite certain that nose ornaments came into India with the Mohammedan invaders, or rather I should say, in the train of the invaders, for who amongst them —Arabs, Persians, Moguls, Turks, Tartars etc —were actually responsible for the introduction, and whether those ornaments were in general use amongst the introducers for any considerable period of time, cannot be determined as yet The evidence of Persian miniature paintings seems to show that it was not in use in that country Manucci's descriptions seem to prove that it was not in general use in the Moghul harems of his day So far for negative evidence

As regards positive evidence, we have the following namely · (i) the use of the Nezem amongst the Hebrews of ancient time and probably some other Semitic tribes, (ii) the picture of the female dancers in Shapur's painting, (iii) the nose ornament worn by the females of the Nogai tribe in common with all tribes of Astrakhan (Costumes of the Empire of Russia) on the borders of the Akhtouba, (iv) the present-day use of nose ornaments in Syria Egypt and parts of other Mahommedan countries, (v) the derivation of the word "Bulak" or "Bulakh" denoting a nose pendant (composed usually of three pearls arranged in a triangle of which the

lowermost is usually an elongated pear shaped pearl) used in Northern India Mr. Divatia says that the lexicon (Asaf-ul lugat) consulted by him gives the derivation as from Turkish and the meaning variously as (*a*) hole, (*b*) the nostril, (*c*) string passed through a camel's nose, and lastly (*d*) as a nose ornament The further information is given that the Turks consider this word as of Eastern (Mr Divatia takes it that "East" in this instance means Arabia, Persia etc) origin The last (vi) and the most important piece of evidence is as follows It can be easily shown that almost all Indian ornaments which were in use in this country in the Pre-Mahommedan period, reached Further or Greater India to the East, meaning such countries as Burma, Malay Peninsula, Java, Bali Borneo, Siam, Indo-China, etc , by means of cultural contact through trade, religion and in some cases actual conquest But strangely enough, of the myriad forms and varieties of nose ornaments not one, not even the practice of wearing ornaments on the nose, can be found to the east of India amongst the actual native present-day peoples of those countries, nor can it be seen on the sculptural or pictorial depictations of the same during the past ages Whereas, with regard to the countries and peoples to the West of India, nose ornaments can be seen as far as the boundaries of Mohammedan empires and kingdoms of the past and present, with very few blank spaces—if at all This certainly does point to the introduction of nose ornaments into India from the West and that by the Mohammedans The countries to the east of India escaped actual conquest by the Mahommedans who overran India, and hence probably the absence of nose ornaments in those countries

With regard to the above-mentioned instance a good deal of further investigation is necessary, which I am unable to do for want of requisite knowledge and reference, and therefore can only indicate the lines on which it may be conducted by those with the proper equipment for the same, and pass on

In (ii) the dancers may be identified from their dress, features, etc , in (iii) the tribes "in the borders of the Akhtouba" may be identified and the custom of using nose ornaments amongst them investigated as to the origin and distribution from the accounts of travellers like Marco Polo on the one side and Muller, Pallas, etc , on the other Accounts of recent travels may also be consulted to find present-day distribution

The evidence in (v) raises a question It is said that Bulak means nostril, a hole, string passed through a camel's nose and, finally, a nose ornament The distribution of nose ornaments along the Astrakhan border of Persia, Syria and Egypt suggests the route of the camel caravans Has this fact any significance ? What about the intermediate places and the further (Central

Asian) reaches of the caravan route? How far can this connection between the camel caravan and the nose ornament be traced?

In this connection it should be mentioned that the word "Nath" or "Nuth" meaning a nose ring, has the widest distribution in India amongst all the names of nose ornaments. We find this term being used all over India as meaning the almost identical ornament, whereas other ornaments have different names in different parts of the country. Nath is the term used in Gujrati, Sindhi, Marathi, Hindi, Bengali, etc., and in Mr. A. K. Iyer's Cochin tribes and castes, we find the same term in use in Cochin too to signify a nose ring. Mr. Divatia says that this word is derived from a Desya word Naththa—णत्था, meaning a nose string as passed through the nostrils of bullocks, camels and the like. He quotes Hemachandra's "Desi namamala" N. 17 which gives नासारज्जु as the only meaning of Nath. All these seem to point to the cattle nose string in general and the camel nose-string in particular as the source of origin of the nose ring and pendant.

The evidence in Arabic and Persian literature on this point would be valuable specially as to the earliest mention of these ornaments.

From Col. Hendley's monograph on "Indian Jewellery" we get a few bits of information regarding the use of nose ornaments abroad from which we gather that such ornaments are in use amongst the Bhots, the hillmen near Kabul, the Pukhto or Pukshto speaking peoples (the Pathans) the Brahuies, the Persians, the Arabs of Zanzibar, the modern Egyptians and in Lars and Ormuz.

We also find from the same source that the Parsi and the Beni-Israel communities had the custom of using nose ornaments, some forty or fifty years ago, but since then this practice gradually fell into disfavour and finally disappeared.

The present-day distribution of nose ornaments in India is very wide and a complete list of names, together with descriptions and mode of wearing, is very difficult to get together. The following list, compiled mainly from Col. Hendley's monograph, is incomplete but may give some idea both in the matter of distribution and that of variety. A few foreign names are also adjoined, just to show the track of the nose ornament, which is from Westwards into India and no further to the East.

SOME NAMES OF NOSE ORNAMENTS IN INDIA AND BEYOND

Term.	*Broad description.*	*Localities where the term is used.*
Nas	Nose ring	Maharashtra.
Nath	Nose ring	Sindh, Punjab, Gujrat,

Term	*Broad description.*	*Localities where the term is used.*
Nath	Nose ring	United Provinces, Behar, Bengal, Bombay, Cochin Rajputana
Nathiya	,,	Behar, Sindh
Nathni	,,	Rajputana United Provinces, Behar.
Nathdhaga		Punjab
Nathu	,,	Madras
Naththa	,,	Madras
Bulak	Nose pendant	Amongst Mohammedans generally and in Punjab, United Provinces, Behar Gujrat
Boolakee	,,	Madras
Bulo	Nose ring	Sindh
Laung	Nose stud	Punjab Sindh, Rajputana, United Provinces, Behar
Bhauriya		Rajputana and nearabouts
Latkan	Nose pendant	Rajputana, Punjab, United Provinces
Nolak	,,	Bengal.
Morni	Peacock-shaped pendant to Nath	Rajputana, Punjab
Phuli	Small ring with a single stone pendant	Punjab
Bolu	A jingling pendant of gold pipal leaves.	Punjab and Kashmir (?)
Machchlian-be-sir.	Headless fish-shaped ornament.	Punjab
Bala	Nose ring	Punjab
Mavkis	,,	Gujrat
Walis	,,	,,
Kanta	,,	,,
Jado	,,	,,
Besar	,,	Gujrat, United Provinces, Behar
Besor	A small Nath	Bombay
Bali	,,	Gujrat.
Phula	Nose ring with pendant.	Brahoe, from Stack's Dist Quoted in "Indian Jewellery."
Chhuchchi	Nose stud	Behar
Nakchanda	,,	,,

Term.	*Broad description.*	*Localities where the term is used*
Jhuhir ..	Nose pendant ..	Behar
Nakchchabi	Nose stud ..	Bengal.
Pezwan .	Nose ring ..	Pukhto or Pukshto (Pathan) words from Bellew's Dist. Quoted by Hendley in "Indian Jewellery."
Natkai ..	,, ..	
Chargul ..	,, ..	
Pishai ..	,, ..	
Halkah-i-bini	Nose ornament	Persian names From Persian Dist by Wollaston Published in 1889 Quoted by Hendley in "Indian Jewellery."
Khazam ..	,, ..	
Barsan ..	,, ..	
Khizam ..	Nose ring ..	Egyptian terms from Lane's "Modern Egyptians" Quoted by Hendley in "Indian Jewellery"
Khuzam	,, ..	

There are two principal methods of wearing these ornaments, first by means of a hole bored in the alae of the nose Hindus of Upper India have only the left alae bored and the Mahommedans the right (Indian Jewellery, page 71) In Madras they frequently bore both the alae The second method is by a hole bored through the septum. This latter practice chiefly obtains amongst the Mahommedans, as far as Northern India is concerned In Bengal little girls usually wear a single pearl or stone pendant suspended from the septum. In the South, specially Orissa and Madras pendants worn through the septum are very common, as is the case amongst the Lepchas and Paharis of Darjeeling. In general it may be said that nose rings and studs, such as Nath, Besar, Bali and Laung, Nakchanda Nakchchabi, are as a rule worn through the alae and pendants such as Latkan, Nolak, Bohr etc , through the septum, but there are exceptions to both the systems

Nose ornaments are gradually going out of favour For example, the more advanced communities like the Parsis, Beni-Israels, Brahmos, etc do not use it any longer although they used to do so not so very long ago The Nath has practically disappeared in Bengal, where the nose stud for grown ups and the Nolak pendant for little girls are the only nose ornaments in general use, and that also not in the higher strata of society

And the sooner this system of hideous disfigurement, foreign to the Indian civilization, disappears from this country the better

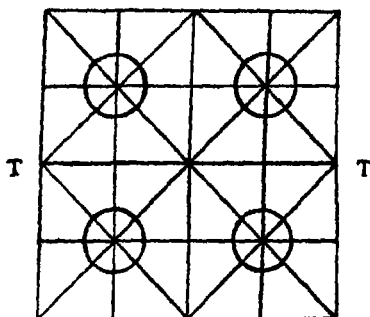
ARTICLE No. 23

Two Types of Sedentary Games prevalent in British Garhwal.

By HEM CHANDRA DAS-GUPTA

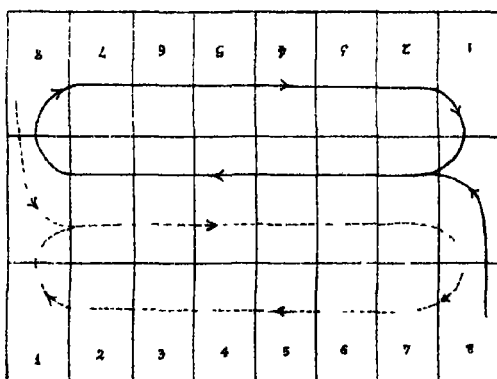
Introduction.

The details of the two types of sedentary games that are recorded here were obtained by me from a few local coolies belonging to British Garhwal during my stay in that district in last October in connection with some geological work The games are known as *bāgh-batti* and *bheri-bakri*.

BĀGH-BATTI.

The game of *bāgh-batti* (bāgh=tiger and batti=guti=piece) is a type of tiger-play and two persons, one of whom is the possessor of two pieces representing two tigers and the other of twenty pieces or *battis*, are necessary for playing it The twenty pieces are to be placed within the four circles and the two *bāghs* at the points T as shown in the diagram. The rules of the game are very similar to those already described by me in connection with the game known as *sher-bakar*[1] with this difference that, in the game of *sher-bakar*, the number of pieces is not twenty but nineteen of which fifteen are equally distributed among 3 circles and only four are placed in the fourth In all other respects the rules of the two games are the same Thus, if the tiger jumps over a circle with more *battis* than one and occupies the immediately next vacant cross-point in the same line, only one *batti* may be captured and for the possessor

1. Journ. Asiat Soc. Bengal, N.S., Vol. XXII, pp 143-148, 1926

of the *battis* to win the game he has to checkmate the two tigers one immediately after the other

BHERI-BAKRI.

The game of *bheri-bakri* (sheep and goat) is played by two persons with 16 pieces equally divided between them and 4 pieces of *cowries* for the purpose of throw The 16 pieces represent the sheep and the goats and those representing the goats are usually of a white colour and those representing the sheep are usually of a black colour By means of the vertical and the horizontal lines the rectangular-diagram used for the play is divided into 24 compartments and of them 8 belong to each player as shown above The pieces are arranged in the order as indicated in the diagram and their movement is regulated by the result of the throw of the *cowries*, the result being described as *poā*, *do*, *tin* or *cār*—*i e.*, the number of points gained—according as the number of *cowries* which show their mouths up after each throw is one, two, three, or four When no *cowrie* shows its mouth up after a throw, the player gets no point to his credit After the players have arranged their pieces in the way as indicated above, in the diagram, they begin to throw the *cowries* and when a player gets a *poā* to his credit, he is able to move the piece lying in the compartment marked 8 to the next one lying in the middle row which may be distinguished as the neutral row After a piece has been moved from its original compartment to that in the neutral row, a player (say A) can move it from one compartment to another, the number of movements being regulated by the number of points gained, *i e*, if he has 3 points in his favour, his piece will occupy the third compartment unless it is already occupied by a piece of his adversary B in which case the latter piece will be captured by A whose piece will now

occupy the compartment thus made vacant. Whoever of the two players succeeds in capturing all the pieces belonging to his adversary is the winner. The rules that have to be observed while playing this game are the following —

1. A player who has a *poā* to his credit is entitled to have a second throw of the *cowries*

2 When there is no point to the credit of a player, *i.e.* when the mouth of no *cowrie* is seen after a throw the next throw passes on to his adversary.

3. One player can play only with one piece at a time *i e* the piece occupying the compartment No 8 has to be brought out first and must be captured by the other player before the former player can bring out the piece occupying the 7th compartment of his own row

4 For all points of one, *i e*, *poā*, the requirements of the pieces lying within the player's own row of compartments must be satisfied first and before all the pieces have been shifted from one compartment to another, the piece which is out of the player's row of compartments may not be moved for a throw that gives to the player credit for one point only, *i e*, *poā*

5. No piece may be moved from its original compartment unless the player to whom the compartment belongs has got a *poā* to his credit. Thus if the piece No 8 belonging to a player be captured and if the piece No 7 has not been previously shifted by him owing to his not having secured already a *poā* necessary for the purpose, it (the piece No 7) shall be moved only when he succeeds in getting a *poā* to his credit and the other throws in the interval, carrying other values, are of no avail to him

6 A player's piece, when out of his own row of compartments, has to be moved from right to left in the neutral row and from left to right in that of his adversary It can never be made to enter the player's own row but must be moved only in the other two rows spirally in the directions as mentioned above and also indicated in the diagram

7 The pieces of the player are to be moved gradually from a lower number to a higher one and to the neutral zone only from the compartment marked 8

ARTICLE No. 24.

Analysis of Race-Mixture in Bengal.

By P C MAHALANOBIS.

Introduction

The problem which I have selected for a preliminary discussion in this paper is the "Analysis of Race-Mixture in Bengal." Dr Annandale had taken very careful measurements of nearly 300 Anglo-Indians (new style) in Calcutta. He selected a sample of 200 individuals which, he believed, represented true Indo-European mixture and turned over the measurements to me for statistical analysis I am publishing elsewhere a detailed analysis of these measurements.[1] During the course of my work a very interesting question arose. How are these 200 Anglo-Indians of Calcutta related to the different caste groups of Bengal? Are they more closely allied with the Hindus? or with the Mahomedans? Do they show a greater affinity with the higher castes of Bengal or with the lower castes? Is there any appreciable admixture with the aboriginal tribes in and on the borderland of Bengal? any appreciable resemblance with castes outside Bengal? In other words, can we obtain any idea about the possible composition of the given sample of Anglo-Indians in terms of the broader social and geographical divisions of the inhabitants of Bengal and its neighbourhood?

In order to answer the above questions we must adopt the usual scientific method of proceeding from the known to the unknown. We shall therefore first of all study the geographical and social resemblances shown by typical Bengal castes whose antecedents and present status are fairly well-known. We shall then be in a position to use these results for investigat-

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Note added on the 26th August, 1927 The present paper contains the substance of the Presidential Address delivered before the Anthropological section of the Indian Science Congress in 1925 It was submitted to the Asiatic Society of Bengal in 1925, but the printing was delayed owing to the absence of the author out of India during the greater part of 1926 and 1927

I have omitted certain personal explanations and also an obituary reference to Dr Annandale, and have altered the form of the address at a few places, but have otherwise left the contents practically untouched I have corrected a few arithmetical slips, added a new reference in a footnote, and a short note on the mean values used in this paper (in Appendix II)

[1] Records of the Indian Museum, Vol 23, 1922

ing the social and geographical connexions of the Anglo-Indians.

In this preliminary survey I have used for comparison 30 typical castes of North India for which anthropometric data were published by Risley in his 2 volumes on "Indian Castes and Tribes" (1891). Fortunately practically all the individuals measured by Risley were over 25 years old (i.e had attained full maturity) so that in a preliminary analysis age-corrections would not be needed. The above 30 castes were selected partly because of their representative character and partly because of the comparatively large size of the samples (usually consisting of about 100 individuals).

The selected castes represent about 6 geographical divisions and 4 or 5 cultural strata I show below both the geographical as well as the cultural classification

(A) Geographical Classification

(1) *Bengal* (8). Brahman, Kayastha, Sadgop, Kaibarta, Rajbansi, Pod, Bagdi and Mahomedan
(2) *Chota Nagpur Tribes* (7) Kurmi, Oraon, Santal, Munda, Bhuiya, Mal Pahari[1] and Malè[1]
(3) *Bihar* (4). Brahman, Goala, Maghya Dom and Dosadh
(4) *North-Western Provinces and Oudh* (5) Brahman, Kayastha, Goala Dom and Chamar
(5) *Punjab* (3). Khatri, Pathan, Chuhra
(6) *Eastern Districts* (3) Lepcha, Chakma and Magh

(B) Cultural Classification

Cultural classification is a much more complicated affair The Hindu community does not present in actual fact a regular hierarchy of social order in which every caste can be placed in a definite intermediate position between any two other castes Social status is again, contrary to orthodox socio-religious theories, not a fixed thing It is changing, and although changes are on the whole slow it is sometimes found that the relative social position of two castes is interchanged within a fairly short time.

The difficulty becomes much greater when we have to compare and fix the relative position of castes belonging to different provinces. In the absence of direct social contact between two castes belonging to different geographical divisions we are thrown back on a comparison through one or

[1] Malès and Mal Paharis were originally included by Risley under Bengal Risley's divisions were given in accordance with the administrative arrangements of his own time. Santal Pergana, the district from which the Mal Pahari and Malès were collected really belongs (both geographically as well as culturally) to Chota Nagpur which is now included in the province of Bihar and Orissa

more intermediary castes and a certain amount of indefiniteness is inevitable Using broad categories such difficulties will however be minimised to a great extent

In the classification adopted below weight has been given to orthodox theories as expounded in books like Nagendranath Bose's "*Bangei Jatiya Itihas*" or Lalmohan Vidyanidhi's "*Sambandha-Nirnaya*" as well as to the actual facts of present day society

(1) *High Castes* (6) Bengal Brahman, Bihar Brahman, N.W P Brahman, Bengal Kayastha; N W P Kayastha, Punjab Khatri

(2) *Middle Castes* (6). Bengal Sadgop, Bengal Kaibarta, Bihar Goala, N W P Goala, Bengal Pod, Bengal Rajbansi

(3) *Low Castes* (6) Bengal Bagdi, Bihar Dosadh, Punjab Chuhra, N W P Chamar, Bihar Dom, N W P. Dom

(4) *Chota Nagpur Aboriginal Tribes* (7) C N. Kurmi, C N Bhuiya. C.N Santal. C.N Oraon. C N Munda, Bengal Mal Pahari and Bengal Male

(5) *Eastern Tribes* (3) Darjeeling Lepcha Chittagong Chakma and Chittagong Magh

(6) *Mahomedans* (2) Bengal Mahomedan and Punjab Pathan

For later comparisons I have included (1) High Castes (2) and Middle Castes together under one head as a distinct group of "upper castes," while in certain portions of the work Bengal Mahomedans have been included under "lower castes"

Out of the above 30 castes of north India I have selected the following 7 Bengal castes for detailed analysis (1) *Brahmans* who represent the highest caste in Bengal (2) *Kayasthas* who socially and culturally come next to the Brahmans (3) *Sadgops*, traditionally cowherds. who are recognised as *Jal-acharaniya*[1] (4) *Kaibartas*, originally fishermen, now mainly agriculturists and petty farmers, some of whom are recognised as *Jal-acharaniya* (5) *Bagdis*, a very low caste almost at the bottom of the social scale, believed to be of aboriginal descent, originally fishermen they are now mostly agricultural labourers or *palki-bearers* Some of them eat beef and pork although others abstain from prohibited flesh (6) *Mal Paharis*, a Hinduised section of the Asal Pahari or Malè tribe of Santhal Parganas. They speak a form of corrupt Bengali but their Hinduisation is not yet complete and they are ranked as the lowest of the low (7) *Mahomedans* from East Bengal.

Brief descriptions of the above castes will be found in Appendix I

[1] Literally "those whose water can be used," i e, castes from whose hands water will be taken by Brahmans and other high castes.

Caste Distances.

My first task now will be to measure the degree of resemblance (and hence presumably the degree of intermixture or convergence) which each of the 7 selected Bengal castes show with each of the other castes belonging to different geographical or different cultural divisions. I have used from 12 to 15 characters (10 absolute measurements and 5 indices) for this purpose.[1] Two castes which differ very largely in physical appearance may be said to be anthropometrically farther apart than two other castes which resemble each other closely. We may in this special sense speak of caste-distances. Two castes which resemble each other closely will have a very small caste distance; on the other hand, castes which are widely different in character will have large caste-distances. The coefficient D (the statistical definition of which is explained in Appendix III) is one such measure of caste-distance. It takes into consideration the average values of the characters concerned but ignores the number of individuals on which such averages are based.

If we wish to give greater weight to samples which comprise a larger number of individuals we may use the "Coefficient of Racial Likeness" used by G. M. Morant and others.[2] I shall call this coefficient C

The actual values of caste-distances measured by the two coefficients D and C are given in Tables 1-7 for each of the 7 selected Bengal groups.

Each table is arranged according to the magnitude of D For example, in Table 1 (Bengal Brahmans) castes appearing high up in the table have smaller caste-distances, i e. resemble the Bengal Brahmans more closely, than castes which appear lower down in the table

Caste Resemblances.

Let us consider Table 1 (Bengal Brahmans) given on p. 310 for a moment. I shall not trouble you with individual figures but even a cursory glance at Table 1 will show you the very high position of almost all the Bengal castes. The implication is of course that the Bengal Brahmans resemble the other Bengal castes far more closely than they (the Brahmans) resemble castes from outside Bengal

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[1] A list of the characters used will be found in Appendix II

[2] Biometrica XIV (1922-23) p. 194. "This is a measure of whether any two races can be considered samples of the same population." It ignores the correlation between mean values of the characters concerned, and assuming equal variabilities for all samples, uses values of average variabilities The statistical definition of the Coefficient of Racial Likeness has been fully discussed by Prof. Karl Pearson in the *Biometrika* Vol. XVIII, 1926, pp. 105-117.

We can use a simple positional index (explained in detail in Appendix IV) to give a rough measure of such provincial or geographical resemblance A positive value of this index indicates a greater resemblance than the average, maximum resemblance being given by an index of +100, a negative value on the other hand shows less than average resemblance, the minimum being an index of -100 The index thus varies between +100 and -100, the value zero showing just average resemblance

For Brahmans the positional index for Bengal is found to be +78·3, showing the great influence of geographical proximity We may call such resemblance associated with geographical proximity as "geographical resemblance" for convenience of reference.

Such "geographical resemblance" is however not confined to the province of Bengal alone It is shown by the other provinces also. For example, the positional index for Bengal Brahmans is, for Bengal +78 3, for Bihar +38 5 and for N W P and Punjab taken together -6·0, showing an effect which clearly decreases with distance

This is not the only kind of resemblance which we can detect. The effect of cultural affinity is also prominent. For example, the positional index for Brahmans is for the "high castes" of Bengal, Bihar and Punjab +87·2 for "middle castes" +80·0, for "low castes" +18 0, and for "aboriginal tribes" of Chota Nagpur -74 0 There can scarcely be any doubt about the existence of a close association between resemblance in physical appearance and cultural affinity

Geographical and Cultural Factors

Summary Table 8, (p. 306) (which gives the positional indices based on serial position) shows at a glance the relative magnitude of the provincial and cultural factors [1]

Bengal (line 1, Table 8) naturally enough contributes a preponderating share to every caste other than Mal Paharis and Mahomedans. Kayasthas (+95 0), Sadgops (+97 6) and Kaibartas (+96 1) have the highest and an almost equal share, and are thus seen to be typical indigenous castes of Bengal.

Bihar (Table 8, line 2) gives an appreciable share to Brah-

[1] Supplementary Tables (8 1)–(8 4) included in Appendix V, give similar figures based not on the average position of the different castes but on the average values of D and C, and are in substantial agreement with Table 8. In this preliminary survey I have considered it sufficient to restrict my analysis to Table 8, i.e., to serial positions irrespective of the actual magnitude of these coefficients. Speaking generally the same results flow from the other Tables (8·1)—(8·4) given in Appendix V (pp. 331-332)

TABLE 8.

Positional Indices based on serial position

Serial No		Brahman	Kayastha	Sadgop	Kaibarta	Bagdi	Malpahari	Mahomedan	Anglo-Indian
	(1) *Provinces*								
1	Bengal (7 or 8)	+78·3	+95·0	+97·4	+96·1	+63·6	+ 9·5	+48·2	+86·4
2	Bihar (4)	+38·5	+48·6	+42·0	+44·0	+20·0	− 10·0	+82·0	+25·4
3	North-West Provinces (5)	−40·2	−51·6	−45·0	−51·5	−50·0	− 18·3	−51·6	−47·2
4	Punjab (3)	+50·1	−20·0	−30·0	38·5	−79·2	−100·0	−12·3	+48·2
5	Chota Nagpur (7 or 6)	−74·0	−50·0	−37·6	−19·1	+49·3	+ 82·6	−14·1	−85·2
6	Eastern Districts (3)	−48·7	−47·3	−71·5	−77·0	−92·3	− 25·0	−79·2	−25·9
	(2) *All Castes (non-aboriginal)*								
7	Upper (13)	+73·8	+64·7	+60·6	+44·9	+31·4	− 9·1	+37·2	+75·3
8	Lower (7)	+ 0	+ 5·2	+11·7	+18·9	−29·0	+ 1·5	+20·3	− 3·2
9	Total (20)	+80·0	+62·0	+80·0	+47·4	− 2·0	− 52·2	+44·0	+80·0
	(3) *Bengal, Bihar and Punjab*								
10	High Castes (4)	+87·2	+51·4	+52·0	+42·0	−12·0	− 72·0	+40·0	+79·2
11	Middle ,, (6)	+80·0	+91·6	+12·0	+88·0	+91·6	+ 50·0	+56·6	+76·6
12	Upper ,, (9 or 10)	+97·6	+90·5	+85·7	+77·4	+53·9	+ 7·1	+60·0	+96·0
13	Lower (5 or 4)	+26·6	+18·3	+37·5	+44·2	−14·0	− 6·0	+58·0	+20·0
14	Total ,, (15)	+96·1	+84·8	+80·0	+86·6	+26·6	− 34·4	+60·9	+90·7
	(4) *Bihar and Punjab*								
15	Upper Castes (4)	+62·3	+18·0	+ 5·0	+ 2·0	−20·0	− 48·0	+44·0	+57·7
16	Lower ,, (3)	+20·7	+18·4	+13·1	+15·7	−28·0	− 51·2	+61·5	+ 5·9
17	Total ,, (7)	+30·6	+20·8	+11·8	+ 9·0	−27·2	− 57·1	+45·9	+42·6
	(5) *Bihar, N. W. P. and Punjab.*								
18	Upper Castes (7)	+28·2	− 3·9	−10·3	−24·5	−35·1	− 50·5	− 5·2	+21·7
19	Lower (5)	−13·7	−20·0	−16·6	−16·6	−40·3	− 26·7	+15·0	−22·8
20	Total ,, (12)	+13·7	−14·7	−14·7	−28·2	−50·0	− 54·1	+ 5·1	+ 3·3

mans (+38·5), Bagdis (+20·0), a considerable share to Kayasthas (+48·0), Sadgops (+42·0) and Kaibartas (+44·0), and makes the biggest and predominating contribution to Mahomedans (+82·0).

Castes from N W P (Table 8 line 3) show a very marked and steady dissimilarity with all the castes analysed here This result is surprising and difficult to explain If real (i e not due to differences in the technique of measurement) it deserves careful investigation

Punjab (Table 8, line 4) contributes largely to the Brahmans (+50·1) but not to any other caste The degree of dissimilarity however steadily increases as we pass from Kayasthas (−20·0), Sadgops (−30·1), Kaibartas (−38·5) Bagdis (−79·2) and Mal Paharis (−100) Social status in Bengal thus appears to vary inversely as the amount of dissimilarity with the Punjab castes

The aboriginal tribes of Chota Nagpur (Table 8, line 5) on the other hand exhibit an opposite but equally steady and systematic gradation The Brahmans show the greatest dissimilarity (−74·0), then come Kayasthas (−50·0), Sadgops (−37·6) and Kaibartas (−19·4) Bagdis actually show a great deal of resemblance (+49·3) while Mal Paharis (+82·6) are seen to belong to the Chota Nagpur aboriginal group itself The gradation described above is so regular in its character that it would be hardly an exaggeration to assert that the lower the social standing of a caste in Bengal the greater is its resemblance with the aboriginal tribes of Chota Nagpur or *vice versa*

The aboriginal castes from the eastern districts show consistent dissimilarity with every Bengal caste analysed here This dissimilarity however does not decrease as we go down the social scale, on the contrary actually increases with decreasing social status We conclude therefore that there is no tendency on the part of the lower castes of Bengal to mix freely with the eastern aboriginal tribes and that whatever little admixture with them may now exist must have occurred through the higher rather than through the lower castes of Bengal [1]

We may now consider the influence of cultural divisions I worked at first with a tri-partite classification "high castes," "middle castes" and "low castes" but as the total number of castes used here is rather small I am giving the final figures for the "high" and "middle castes combined under one head "upper castes"

Taking into consideration all non-aboriginal castes, the positional indices for "upper" and "lower" castes are shown

[1] I should point out however that this result is only tentative further analysis particularly of the lower castes of Eastern Bengal, is necessary before a result of such wide implication can be accepted

separately in the above Table A, all the figures being taken from Table 8. Figures for Chota Nagpur are included for comparison. The systematic and perfectly regular character of the changes in the value of P as we pass from Brahmins to Mal Paharis is quite remarkable. Resemblance with

TABLE A. POSITIONAL INDICES.

	Brahman	Kayastha	Sadgop	Kaibarta	Mahomedan	Bagdi	Mal Pahari
All Non aboriginal Castes.							
"Upper castes" (13)	+73.5	+61.7	+60.6	+44.9	+37.2	+31.4	−9.1
"Lower castes" (7)	0	+7.2	+11.7	+16.9	+20.3	−29.0	+1.5
Chota Nagpur Tribes (7)	−74.0	−50.0	−37.6	−19.4	−11.1	+49.3	+82.6

"upper castes" decreases *pari passu* with the increase in resemblance with "lower castes." So that the actual degree of resemblance with either the "upper castes" or with the "lower castes" furnishes a reliable index of social status.[1] Judged by this test (East) Bengal Mahomedans would appear to occupy a position a little below the Kaibartas.

If we take Bihar and the Punjab (Table 8, line 15) together (omitting N.W.P. as it does not contribute anything appreciable), we can gain some idea about the extra-provincial contribution from the north-west. The "upper castes" (now including Pathans) contribute a very large share to Brahmans (+62.0), a moderate share to Mahomedans (+44.0), and only a small and decreasing share to Kayasthas (+18.0), Sadgops (+8.0) and Kaibartas (+2.0) and actually show moderate dissimilarity with Bagdis (−20.0) and great dissimilarity with Mal Paharis (−44.0). The lower castes contribute very largely to Mahomedans (+61.5), and only slightly to Brahmans (+20.7), Kayasthas (+18.4), Sadgops (+13.1) and

[1] The chief reason of a marked dissimilarity between Bagdis and "lower castes" is probably this. My list includes only one low caste from Bengal e.g. Bagdis, in comparing with Bagdis this of course goes out, so that *for Bagdis* the "low castes" group contains castes from outside Bengal only, and the dissimilarity noticed here is probably largely due to the effect of geographical distance.

Kaibartas (+15·7); Bagdis (−28·0) and Mal Paharis (−51·2) again show moderate and great dissimilarity respectively

The total contribution of Bihar and the Punjab (Table 8, line 17) shows interesting contrasts with the contribution of Chota Nagpur (Table 8, line 5) Brahmans show the greatest resemblance with Bihar and the Punjab (+50·6) and the greatest dissimilarity with Chota Nagpur (−74·0) Kayasthas, Sadgops and Kaibartas exhibit decreasing resemblance with Bihar and the Punjab (+20·8, +11·8, +9·0 respectively), and at the same time decreasing dissimilarity with Chota Nagpur (−50·0, −37·6, and −19·4 respectively) Bagdis show moderate dissimilarity (−27·2) with the northern provinces and a moderate similarity (+49·3) with Chota Nagpur while the Mal Paharis show the greatest dissimilarity with the northern provinces (−51·2), and the greatest similarity with Chota Nagpur (+82·6). The case of the Mahomedans is the only exception, they show large resemblances with Bihar and the Punjab (+44·0), and only slight dissimilarity with Chota Nagpur (−14·1) It should be noted, however, that the Mahomedans show greater resemblance with the "lower castes" and in this respect offer a marked contrast to the Brahmans who derive by far the greater part of their contribution from the upper castes

We may then say generally that the greater the similarity with the castes (particularly with the upper castes) of Bihar and the Punjab the greater is the dissimilarity with the aboriginal tribes of Chota Nagpur and *vice versa* The variation of resemblance with Chota Nagpur is however more strongly marked than that with Bihar and the Punjab, and this greater intensity may probably be ascribed to the greater geographical proximity

The results for Bengal, Bihar and the Punjab (as also for Bihar, N W P and the Punjab) given in Table 8 lines 14–20 taken together corroborate the same thing The total for all castes (excluding aboriginal tribes) given in Table 8, line 9 shows at a glance the proportions of caste admixture in the different castes; there is again a perfectly regular gradation from Brahmans (+80·0) to Mal Paharis (−52·2)

Analysis of Bengal Castes

We may now rapidly review the results for each caste separately

Brahmans (Table 1) The Bengal Brahmans stand out prominently as the only caste in Bengal which shows definite evidence of resemblance with the Punjab and also a substantial amount of resemblance with "upper castes" outside Bengal [1]

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[1] The position of the three Punjab castes is surprisingly high (4th 9th, 12th) The resemblance between the Bengal Brahmans and Punjab

The Brahmans also show marked dissimilarity with the aboriginal tribes of Chota Nagpur and considerable dissimilarity with the eastern tribes[1] At the same time it is evident that considerable intermixture with the other castes (particularly the upper castes) of Bengal has occurred so that the Brahmans may now be looked upon as a true Bengal caste

One very striking thing in Table I is the close association between resemblance with the Brahmans and social status in Bengal The proposition the higher the social status the

TABLE I

Bengal Brahman (100)

Serial Order	Province and Caste	Social Status	n	D	C
1	Bengal Kayastha	High	100	0 236	10 8
2	„ Sadgop	Middle	48	0 319	9 [illegible]
3	„ Kaibarta		100	0 331	16 5
4	Punjab Khatri	High	60	0 413	11 [illegible]
5	Bengal Pod	Middle	100	0 431	21 5
6	Bihar Brahman	High	67	0 496	18 9
7	„ Goala	Middle	100	0 587	28 2
8	Bengal Mahomedan	Lower	185	0 595	37 2
9	Punjab Chuhra		80	0 641	27 5
10	Bengal Rajbansi	Middle	100	0 693	33 6
11	N W P Brahman	High	100	0 801	39 0
12	Punjab Pathan	Upper	80	0 804	34 7
13	Bihar Dom	Lower	100	0 841	41 0
14	Bengal Bagdi		99	0 857	41 1
15	Bihar Dosadh		100	1 155	56 7
16	Darjeeling Lepcha	Abor	57	1 124	39 8
17	C N Kurmi		100	1 284	63 2
18	N W P Dom	Lower	100	1 397	68 8
19	C N Oraon	Abor	100	1 411	69 7
20	N W P Kayastha	High	100	1 454	71 7
21	C N Santal	Abor	100	1 781	88 1
22	Chittagong Magh	„	100	1 792	88 6
23	N W P Goala	Middle	100	1 875	92 8
24	C N Bhuiya	Abor	100	1 998	98 8
25	„ Munda		100	2 035	100 8
26	Chittagong Chakma		100	2 540	126 0
27	(C N) Mal Pahari	„	100	2 549	126 4
28	N W P Chamar	Lower	100	2 687	133 1
29	(C N) Male	Abor	100	2 983	148 [illegible]

N B The Probable Error of C (C R L) is ± 0 23

Pathans (D=0 804 C=34 7) is much greater than that between the Pathans and the Bengal Mahomedans (D=1 828, C=101 0), and is actually only a little less than that between the Bengal Brahmans and the Bengal Mahomedans (D=0 595, C=37 2)

[1] The Brahmans offer (Table 8) a complete contrast to the aboriginal tribes of Chota Nagpur (−74 0) and also to the tribes of the east (−48 0)

greater is the resemblance with the Bengal Brahmans" is almost literally true for every province For example, the order of resemblance in the Punjab is Khatri (4th), Chuhra (9th), both Hindu castes, and then Pathan (12th) In Bihar the order is Brahman (6th) Goala (7th), Dom (13th) and Dosadh (15th)

In Bengal itself the upper castes Kayasthas (1st) Sadgop (2nd), Kaibartas (3rd) and Pod (5th) occupy the first few places in the strict order of their social precedence Then come the Mahomedans (8th) and after the Mahomedans, Rajbansi (10th) and Bagdi (14th) The inference that intermixture with Bengal Brahmans has varied directly as the cultural proximity of the caste concerned can scarcely be resisted

Among the aboriginal tribes of Chota Nagpur, Kurmis show the greatest resemblance with Bengal Brahmans This is not surprising as we know that the Kurmis are culturally nearest to the Hindus Then come Oraon Santal, Bhuiya, Munda and finally Mal Pahari and Malè[1] The eastern tribes come in the order Darjeeling Lepcha, Chittagong Magh and Chittagong Chakma[2]

The present analysis seems to show that the Brahmans in Bengal can justifiably claim their descent partly from the Punjab and the upper provinces of Northern India Considerable intermixture in Bengal (or convergence under climatic selection) must also have occurred, particularly with the upper castes who are culturally nearer to the Brahmans The Brahmans do not appear to have intermixed appreciably with the eastern tribes and are practically free from racial contact with the aboriginal tribes of Chota Nagpur

Other high castes of Bengal The Kayasthas, the Sadgops and the Kaibartas all appear to be castes originally indigenous to Bengal They show the same amount of moderate resemblance with Bihar but do not show any resemblance with the Punjab

On the whole resemblance with the aboriginal tribes of Chota Nagpur is not appreciable, but the regular and systematic character of the variation indicates that intermixture with the Chota Nagpur tribes has taken place with increased frequency as we go down the social scale

Kayasthas (Table 2) They show great resemblance with all the Bengal castes, particularly with the 'middle castes' of Bengal, indicating either close intermixture, or surreptitious absorption through the unauthorised adoption of Kayastha

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[1] The chief differences with the Chota Nagpur tribes occur in nose form and size, stature and the fronto-zygomatic index

[2] The greatest differences occur in the bizygomatic breadth, fronto zygomatic index and stature, and for the two Chittagong tribes also in nasal breadth and nasal index

TABLE 2

Bengal Kayastha (100)

Serial Order	Province and Caste.	Social Status	n	D	C
1	Bengal Sadgop ..	Middle	45	0·079	1 6
2	,, Kaibarta ..		100	0 155	6 7
3	,, Pod	,,	100	0 174	7 7
4	,, Brahman ..	High	100	0 234	10 7
5	,, Mahomedan	Lower	185	0 304	18 5
6	Bihar Goala	Middle	100	0 389	18 4
7	,, Brahman	High	67	0 416	15 7
8	Bengal Rajbansi	Middle	100	0 426	20 3
9	,, Bagdi	Lower	99	0 495	23 3
10	C N Kurmi	Abor	100	0 833	40 6
11	Bihar Dosadh	Lower	100	0 849	41 4
12	,, Dom		100	0 889	43 4
13	Punjab Khatri	High	60	0 909	33 1
14	Darjeeling Lepcha	Abor	57	0 976	34 4
15	Punjab Chuhra	Lower	80	1 006	43 7
16	C N Oraon	Abor	100	1 040	49 2
17	N W P Brahman .	High	100	1 091	53 5
18	,, Kayastha .	.	100	1 295	63 7
19	C N Santal .	Abor	100	1 406	69 5
20	N W P Dom	Lower	100	1 417	69 8
21	C N Bhuiya	Abor	100	1 438	70 9
22	N W P Goala	Middle	100	1 486	73 3
23	Chittagong Magh	Abor	100	1 501	74 0
24	C N Munda ..	,,	100	1 629	80 4
25	Punjab Pathan	Upper	80	1 716	75 2
26	(C N) Mal Pahari	Abor	100	2 045	101 2
27	Chittagong Chakma	,,	100	2 290	113 5
28	(C N) Male .	.	100	2 396	116 8
29	N W P Chamar .	Lower	100	2 437	120 8

N.B.—The Probable Error of C (C R L.) is ±0·28

names and habits by persons belonging to lower castes, or convergence under climatic selection In fact they appear to be more closely connected with the Sadgops (1st), Kaibartas (2nd) and Pods (3rd) than with the Brahmans (4th). Resemblance with Mahomedans (5th) is also fairly close

Omitting the Brahmans the rule about association between social status and order of resemblance is strictly preserved in Bengal (Sadgop, Kaibarta, Pod, Mahomedan, Rajbansi and Bagdi) In Bihar, Goala takes precedence over the Brahmans, otherwise the rule is again obeyed In N.W P and the Punjab also the order of social status is faithfully reproduced in the table for caste resemblance with the only exception of N W P Goala The Kayasthas show less dissimilarity with the aboriginal tribes (—50 0) than the Brahmans (—74 0), but the resemblance is negligible (Table 8, line 5).

The Bengal Kayasthas thus appear to be an indigenous caste showing close resemblance with other Bengal castes, fairly close connections with Bihar but not with N.W P. or the Punjab They are more closely connected with the "middle" castes than with the Brahmans,[1] but are practically free from intermixture with the aboriginal tribes.

Sadgops (Table 3) There is very little difference between the Sadgops and the Kayasthas on the whole The Sadgops

TABLE 3.

Bengal Sadgop (48)

Serial Order	Province and Caste	Social Status	n	D	C
1	Bengal Pod ..	Middle	100	0 033	0 1
2	,, Kaibarta ..	,,	100	0 064	1 1
3	,, Kayastha	High	100	0·079	1 6
4	,, Mahomedan	Lower	185	0 195	6 4
5	,, Rajbansi ..	Middle	100	0 239	6 7
6	Bihar Goala ..	,,	100	0 273	7 8
7	Bengal Bagdi .	Lower	99	0 302	8 6
8	,, Brahman	High	100	0 319	9 3
9	Bihar Brahman ..	,,	67	0 349	8 7
10	C N Kurmi ..	Abor	100	0 588	18 0
11	Bihar Dom .	Lower	100	0 602	18 5
12	C N Oraon	Abor	100	0 649	20 0
13	Bihar Dosadh .	Lower	100	0 672	20 8
14	Punjab Khatri	High	60	0 807	20 5
15	N W P Brahman ..	,,	100	0 831	25 9
16	Punjab Chuhra	Lower	80	0 862	24 8
17	N W P Dom	,,	100	0 945	29 6
18	C N Santal ..	Abor	100	0 956	30 0
19	N W P Kayastha ..	High	100	0 986	30 9
20	Darjeeling Lepcha .	Abor	57	1 019	25 5
21	C N Bhuiya ..	,,	100	1·022	32 1
22	,, Munda	,,	100	1 131	35 6
23	N W P Goala	Middle	100	1 175	37 1
24	Chittagong Magh .	Abor	100	1 200	37 9
25	(C N) Mal Pahari .	,,	100	1 527	48 5
26	,, Malè ..	,,	100	1 797	57 2
27	Punjab Pathan ..	Middle	80	1 828	53 8
28	N W P Chamar .	Lower	100	1 896	60 4
29	Chittagong Chakma	Abor	100	2·005	64·0

N B —The Probable Error of C (C.R L) is ± 0·28

show slightly greater contact with the "lower castes," and also with the aboriginal tribes of Chota Nagpur. Resemblance

[1] In fact on the data here analysed Bengal Kayasthas would seem to be more closely allied to the "middle" rather than the "higher" castes of North India This result is a little surprising and deserves further study

with eastern tribes is however less pronounced than in the case of both Brahmans and Kayasthas

The order of resemblance shows very interesting reversals in the order of social precedence in Bengal. We have already seen that the Kayasthas show the greatest resemblance with Sadgops but the latter show greater resemblance with both Pods and Kaibartas than with Kayasthas Contact with Mahomedans is also very close but the position of Bengal Brahmans (4th in the list for Kayasthas) is much lower (8th for Sadgops).

Kaibartas (Table 4) The Kaibartas show as much intermixture within Bengal and as close a contact with Bihar as Kayasthas and Sadgops There is however greater dissi-

TABLE 4

Bengal Kaibarta (100).

Serial Order	Province and Caste	Social Status	n	D	C
1	Bengal Pod	Middle	100	0 061	2 0
2	„ Sadgop	„	48	0 065	1 1
3	„ Bagdi	Lower	99	0 122	5 0
4	„ Mahomodan		185	0 142	8 1
5	„ Kayastha	High	100	0 155	6 7
6	Bihar Goala	Middle	100	0 192	8 6
7	Bengal Rajbansi	„	100	0 207	9 3
8	Bihar Brahman	High	67	0 356	13 3
9	Bengal Brahman	„	100	0 365	17 2
10	C N Kurmi	Abor	100	0 375	17 7
11	Bihar Dosadh	Lower	100	0 420	20 4
12	C N Oraon	Abor	100	0 430	20 5
13	Bihar Dom	Lower	100	0 472	22 6
14	C N Santal	Abor	100	0 703	34 1
15	Punjab Chuhra	Lower	80	0 727	31 3
16	C N Bhuiya	Abor	100	0 728	35 4
17	Punjab Khatri	High	60	0 731	26 5
18	C N Munda	Abor	100	0 811	39 5
19	N W P Dom	Lower	100	0 827	40 3
20	„ Brahman	High	100	0 833	40 6
21	Darjeeling Lepcha	Abor	57	0 846	29 7
22	N W P Kayastha	High	100	0 934	45 7
23	„ Goala	Middle	100	1 004	49 2
24	(C N) Mal Pahari	Abor	100	1 163	57 1
25	Chittagong Magh	„	100	1 239	60 9
26	(C N) Malè	„	100	1 414	69 7
27	N W P Chamar	Lower	100	1 646	81 3
28	Punjab Pathan	Middle	80	1 819	79 8
29	Chittagong Chakma	Abor	100	1 965	97 2

N B - The Probable Error of C (C R.L is ± 0·28)

milarity with N.W P. and the Punjab They show (Table 8) less affinity with upper "castes" (+44 9) than both Kayasthas

(+64 7) and Sadgops (+60·6) and also greater resemblance with "lower castes," much less dissimilarity with the aboriginal tribes of Chota Nagpur (−19 4), but less contact[1] with the eastern tribes (−77 0)

The order of resemblance again shows interesting reversals. Bengal Pods show the greatest resemblance with the Kaibartas, next come Sadgops, Bagdis and Mahomedans, indicating that considerable intermixture must have occurred with low castes like Bagdis as well as with Mahomedans Naturally enough Brahman comes last. In Bihar, the Goala gets precedence over the Brahman, and the Dosadh over the Dom In Chota Nagpur the order Kurmi, Oraon, Santal, Bhuiya, Mal Pahari and Malè, and in eastern districts the order Lepcha, Magh, Chakma are still preserved. N W P Dom is now above N W P Brahmans, otherwise the order remains the same. Punjab Chuhra (a low caste) is also now higher than the Khatri (a higher caste) All these of course merely point to a close affinity with the lower castes of all the provinces

Bagdis (Table 5) While Brahmans Kayasthas Sadgops and Kaibartas show a natural gradation and may be classed as true Bengal castes, Bagdis exhibit a number of peculiarities First of all although considerable intermixture within Bengal is indicated, positional index for Bengal (Table 8) being (+63 6), it is much less than what we found to be the case for the other four castes (+78 3, +95 0, +97 4 and +96 1 for Brahmans, Kayasthas, Sadgops and Kaibartas respectively) Evidently Bagdis contain considerable admixture from outside Contribution of Bihar is comparatively small (P = +20 0) while N W P (−50 0) and Punjab (−79 2) show great dissimilarity[2] We find however that the contribution of Chota Nagpur is very large (P = +49 1).

In Bengal Kaibartas (1st) show the greatest resemblance with the Bagdis, and then Rajbansi (3rd) and Sadgops (4th) Kayasthas (10th) and still more so Brahmans (20th) occupy low positions indicating comparatively little intermixture Resemblance with Mahomedans (11th) is also slight

The Santals occupy the 2nd position showing a very close resemblance indeed. Next come Mundas (6th), Kurmi (8th), Oraon (9th) and Bhuiya (12th)—the order being now quite different from the one we found for the higher Hindu castes

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[1] Chief differences with Bihar occur in bi zygomatic breadth, with Chota Nagpur in nose size and form, with N W P and with the Punjab in cephalic index, cephalic breadth and fronto-zygomatic index The eastern tribes differ considerably in bi-zygomatic breadth and cephalic breadth and less in nasal and cephalic index

[2] The greatest difference occurs in height from vertex to chin and vertico-cephalic index

TABLE 5.

Bengal Bagdis (99).

Serial Order	Province and Caste	Social Status	n	D	C
1	Bengal Kaibarta* ..	Middle	100	0 123	5 2
2	C N Santal ..	Abor	100	0 262	12 1
3	Bengal Rajbansi .	Middle	100	0 266	12 3
4	,, Sadgop* .	.	48	0 303	8 8
5	Bihar Goala* ..	,,	100	0 305	14 3
6	C N Munda .	Abor	100	0 329	15 5
7	Bengal Pod .	Middle	100	0 421	20 1
8	C.N Kurmi	Abor	100	0 455	21 8
9	,, Oraon .	,,	100	0 456	21 9
10	Bengal Kayastha* ..	High	100	0 495	23 8
11	,, Mahomedan	Lower	185	0 539	28 3
12	C N Bhuiya	Abor	100	0 540	26 1
13	Bihar Brahman*	High	67	0 652	27 3
14	C N Mal Pahari	Abor	100	0 687	33 5
15	Bihar Dom	Lower	100	0 703	35 4
16	C N Male	Abor	100	0 771	37 7
17	Bihar Dosadh	Lower	100	0 802	39 2
18	N W P Dom* .	,,	100	0 829	40 6
19	,, Goala*	Middle	100	0 902	44 3
20	Bengal Brahman*	High	100	0 910	44 7
21	N W P Kayastha		100	0 952	46 8
22	,, Brahman* .	.	100	0 985	48 4
23	Punjab Khatri		60	1 072	39 0
24	. Chuhra	Lower	80	1 155	50 0
25	N W P Chamar*		100	1 437	71 1
26	Darjeeling Lapcha	Abor	57	1 446	51 3
27	Chittagong Magh	.	100	1 455	72 0
28	,, Chakma		100	2 201	109 4
29	Punjab Pathan	High	80	2 975	130 5

N B — The Probable Error of C (C R L) is ± 0 25 *for castes marked with an asterisk it is* ± 0 28

The Bagdis thus present a very mixed character Even if the original stock was indigenous to Bengal very considerable admixture with the aboriginal tribes of Chota Nagpur (particularly with the Santals) must have taken place subsequently. They also show moderate amount of resemblance with the lower castes of Bihar but no connexions with the eastern tribes [1]

Mal Paharis (Table 6) The Mal Paharis do not belong to Bengal at all although a considerable amount of intermixture with the Bagdis (5th), Rajbansis (6th), Pods (7th) and Kaibartas (9th) is indicated by the comparatively high position occupied by these castes. The resemblance with Chota Nagpur

[1] The dissimilarity is greatest in cephalic breadth, bi-zygomatic breadth, height from vertex to chin, and in cephalic, nasomalar and fronto-zygomatic indices

tribes is strikingly close (P= +82·6, Table 8) and leaves little doubt that Mal Paharis form one of the typical aboriginal tribes of Chota Nagpur

TABLE 6.

(C.N.) *Mal Pahari* (100)

Serial Order	Province and Caste	Social Status	n	D	C.
1	(C N) Malé*	Abor	100	0 035	0 7
2	C N Bhuiya*	,,	100	0 065	2 2
3	,, Munda	,,	100	0 191	8·5
4	,, Santal	,,	100	0 240	11 0
5	Bengal Bagdi	Lower	99	0 687	32 8
6	,, Rajbansi	Middle	100	0 864	42 2
7	,, Pod	,,	100	0 991	48 5
8	Bihar Goala*	,,	100	1 097	53·8
9	Bengal Kaibarta*	,,	100	1 164	57 2
10	C N Oraon	Abor	100	1 186	58 3
11	N W P Dom*	Lower	100	1 223	60 2
12	Chittagong Magh	Abor	100	1 264	62 2
13	C N Kurmi	,,	100	1·312	64·6
14	N W P Goala*	Middle	100	1 370	67 5
15	,, Chamar*	Lower	100	1 481	73 0
16	Bengal Sadgop*	Middle	48	1 532	48 6
17	Bihar Dom	Lower	100	1 646	81 3
18	Chittagong Chakma	,,	100	1 668	82 4
19	Bihar Brahman*	High	67	1 829	72 3
20	Bengal Mahomedan	Lower	185	1 867	119 0
21	Bihar Dosadh	,,	100	1 885	93 2
22	N.W P. Kayastha*	High	100	1 932	95 6
23	Bengal Kayastha*	,,	100	2 045	101 2
24	N W P Brahman*	,,	100	2·177	107 8
25	Darjeeling Lapcha	Abor	57	2 283	81 9
26	Bengal Brahman*	High	100	2 633	130 6
27	Punjab Chuhra	Lower	80	2·814	123·9
28	,, Khatri	High	60	2·866	106 5
29	,, Pathan	Middle	80	3 774	166 6

N.B.—The Probable Error of C (C.R L) is ±0 25 , *for castes marked with an asterisk it is* ±0 28

The resemblance between Mal Paharis and Malès is very close, so much so that it is practically impossible to distinguish between the two. They show very little resemblance with the Bengal Brahmans; the biggest differences occur in nasal index, nasal breadth, fronto-zygomatic index, nasal height, stature, frontal breadth, and height from vertex to chin. It is significant that the Malè and the Mal Pahari resemble each other closely in the very characters in which they both differ most from the Brahmans, i.e., in nose form and size, stature and frontal breadth.

There is practically no connexion with Bihar There is great dissimilarity with both N W P [1] and the Punjab [2] as well as with the two Chittagong tribes Chakma and Magh [3] and with Darjeeling Lepchas [4]

We therefore conclude that the Mal Paharis represent a true aboriginal tribe from Chota Nagpur, which shows slight admixture with some of the lower castes of Bengal They have no resemblance with the castes of Bihar N W P the Punjab nor with the eastern tribes

Mahomedans (Table 7) The Bengal (or rather East Bengal) Mahomedans do not appear to be a purely indigenous group Although they show signs of considerable intermixture (Table 8) within Bengal (P = +48 2), a large number were probably originally derived from Bihar (P = +82 0) Dissimilarity with Chota Nagpur is less pronounced (−14 1) than in the case of the upper castes of Bengal, but dissimilarity with N W P. is just as clearly marked Although the Mahomedans in the present sample all come from East Bengal they do not show any resemblance with the eastern tribes (P = −79 2). The Punjab also does not show any resemblance (P = −12 3)

It is rather significant that the order of resemblance within a province has now no connexion with the order of social precedence For example, in Bengal the order is Kaibarta, Sadgop, Kayastha, Bagdi Brahman and Rajbansi In Bihar Goala, Dom, Dosadh and Brahman In N W P. Dom, Brahman, Kayastha, Goala, and in the Punjab Chuhra, Khatri, Pathan

On the whole Mahomedans show pronounced resemblance with "lower castes' In fact from the relative amount of resemblance with 'upper" and "lower" castes they would seem to occupy culturally a position which is a little lower than the Kaibartas

The East Bengal Mahomedans appear to have been derived to a large extent from Bihar particularly from the lower castes They have intermixed extensively with the 'middle" and "lower" castes of Bengal and also to a smaller extent with one or two aboriginal tribes of Chota Nagpur, but do not show any connexions with N W P nor with the Punjab Pathans In spite of geographical proximity they do not appear to have had any relations with the eastern tribes

[1] Chiefly in nasal width, height from vertex to chin, nasal index and vertico cephalic index

[2] In all characters other than head length, head breadth and cephalic index

[3] Chiefly in cephalic breadth, height from vertex to chin, cephalic index and to a smaller extent in nasal length and nasal index

[4] Very considerably in nose length, nose width and nasal index and to a smaller extent in head breadth and cephalic index

TABLE 7.

Bengal Mahomedan (185).

Serial No	Province and Caste	Social Status.	n	D	C
1	Bihar Goala*	Middle	100	0·107	5·9
2	Bengal Kaibarta*	,,	100	0·108	6·0
3	Bihar Dom	Lower	100	0·173	10·2
4	C N Kurmi	Abor	100	0·183	10·8
5	Bengal Sadgop*	Middle	48	0·199	6·6
6	Bihar Dosadh	Lower	100	0·232	14·0
7	Bengal Kayastha*	High	100	0·303	18·6
8	C N Oraon	Abor.	100	0·310	19·1
9	Bihar Brahman*	High	67	0·374	17·4
10	Bengal Bagdi	Lower	99	0·533	33·3
11	,, Brahman*	High	100	0·588	37·1
12	Punjab Chuhra	Lower	80	0·743	40·4
13	,, Khatri	High	60	0·757	33·3
14	Bengal Rajbansi	Middle	100	0·809	51·5
15	C N Santal	Abor	100	0·888	56·6
16	,, Munda	,,	100	0·977	62·4
17	N W P Dom*	Lower	100	1·033	66·0
18	,, Brahman*	High	100	1·196	76·6
19	Bengal Pod	Middle	100	1·223	78·4
20	Darjeeling Lepcha	Abor	57	1·351	57·9
21	N W P Kayastha	High	100	1·457	93·5
22	,, Goala*	Middle	100	1·460	93·8
23	C N Malé	Abor	100	1·542	99·3
24	,, Bhuiya	,,	100	1·815	116·8
25	Punjab Pathan	Middle	80	1·828	101·0
26	(C N) Mal Pahari	Abor	100	1·868	120·2
27	Chittagong Magh	,,	100	1·878	120·9
28	N W P Chamar*	Lower	100	2·117	136·3
29	Chittagong Chakma	Abor	100	2·671	172·3

N B The Probable Error of C (C R L) is ±0·25 for castes marked with an asterisk it is ±0·28.

Summary of Analysis for Bengal Castes

Summing up we find that intermixture within Bengal, i e , intra-provincial intermixture has varied with the degree of cultural proximity, so that for Brahmans the amount of intermixture with other castes has been in proportion to the social standing of the caste concerned Influence from outside Bengal, i e inter-provincial intermixture has followed two well-defined and clearly distinguished streams, one from the castes of northern India (chiefly from Bihar and the Punjab), and the other from the aboriginal tribes of Chota Nagpur The influence of the northern Indian castes decreases and that of the aboriginal tribes of Chota Nagpur increases as we go down the social scale In fact these two streams exhibit a marked opposition the greater the resemblance with northern

India the greater being the dissimilarity with the aboriginal tribes and *vice versa*.

None of the castes analysed here show much resemblance with any of the aboriginal tribes of the east. In fact so far as the present analysis goes the Bengal groups appear to show a definite repugnance (which is still more strongly marked for the lower castes and the Mahomedans) against intermixing with the eastern aboriginal tribes

Influence of North-Western Provinces is also surprisingly small and requires further investigation

Brahmans, Kayasthas, Sadgops and Kaibartas come out as true Bengal Hindu castes The Brahman alone can justifiably claim definite connexions with upper India, particularly with the Punjab The Kayastha, the Sadgop and the Kaibarta all show comparatively little resemblance with upper India, and exhibit a systematic gradation of decreasing influence from North India and increasing intermixture with the Chota Nagpur aboriginal tribes Bagdis appear to be a highly mixed group of which the basic stock was probably indigenous to Bengal but which subsequently very considerably intermixed with the aboriginal tribes of Chota Nagpur (particularly with the Santals) and also partly with the lower castes of Bihar. Mahomedans also show a highly mixed character They appear to be originally largely derived from Bihar but have intermixed extensively in Bengal, they do not show any resemblance with the Punjab Pathans

The above results are not at all startling, and with the exception of the N W P, are just what one would expect from the known social history of the castes concerned The results of our analysis are thus in general agreement with the actual facts of the ethnic situation This is re-assuring and gives us confidence in using the present method for the analysis of the Anglo-Indian sample

Analysis of the Anglo-Indian sample

We may now go back to our original problem, and in the light of the results described above attempt a provisional analysis of the Anglo Indian sample Using 7 characters, *e.g*, head length, head breadth, nasal length, nasal breadth, cephalic index, nasal index and stature,[1] I find the caste-distances shown in the following Table 9 and positional indices shown in Col 8 of Table 8

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[1] I regret I have not been able to use other characters in the present analysis owing to uncertainty about the comparability of the measurements · work is however proceeding and I hope to publish a more detailed analysis in the near future Results based on only 7 characters are of course only tentative

TABLE 9.

Anglo-Indians (200).

Serial Order	Province and Caste	Social Status	n	D²	C²
1	Bengal Brahman	High	100	·022	0·5
2	,, Kyastha	,,	100	·034	1·3
3	,, Sadgop . .	Middle	48	·082	2·2
4	Bengal Pod	Middle	100	·204	12·0
5	Punjab Pathan	Upper	80	·208	10·9
6	Bengal Kaibarta . .	,,	100	·222	13·8
7	Bengal Mahomedan	. .	183	·298	27·6
8	Bihar Brahman	High	67	·303	14·2
9	Bihar Goala	,,	100	·319	20·3
10	Punjab Khatri	High	80	·470	20·7
11	Bengal Rajbansi . .	Middle	100	·512	33·1
12	Punjab Chuhra	Lower	80	·678	37·7
13	Darjeeling Lepcha	Abor	57	·758	32·6
14	Bengal Bagdi .	,,	99	·776	50·4
15	Bihar Dosadh	,,	100	·857	56·1
16	N W P Brahman	High	100	·871	57·1
17	Bihar Dom	,,	100	·932	61·1
18	C N. Kurmi	Abor	100	1·029	67·6
19	Chittagong Magh	Abor	100	1·160	76·3
20	N W.P Dom	Lower	100	1·239	81·0
21	,, Kayastha	,,	100	1·331	87·7
22	N W P Goala	Middle	100	1·479	97·6
23	C N Oraon	,,	100	1·533	101·2
24	C N Santal . .	Abor	100	1·968	130·2
25	Chittagong Chakma	,,	100	2·052	135·8
26	C N Bhuiya	,,	100	2·201	145·7
27	,, Munda . .	,,	100	2·524	167·3
28	N W.P Chamar	Lower	100	2·832	187·8
29	(C N) Mal Pahari	,,	100	3·094	205·3
30	C N Malé .	,,	100	3·633	241·2

N B. The Probable Error of C² (C R L) is ±0·54.

It will be noticed that the positional indices for the Anglo-Indians (Table 8) are very similar to those for the Bengal Brahmans. The chief differences are the slightly greater resemblance with Bihar, and the markedly less dissimilarity with the eastern tribes shown by the Anglo-Indians

Intermixture within Bengal is very great: resemblance with both Brahmans[1] and Kayasthas being strikingly close The order of resemblance within Bengal (Brahman, Kayastha, Sadgop, Pod, Kaibarta, Mahomedan, Rajbansi and Bagdi) very accurately reproduces the order of social precedence

[1] In fact the Bengal Brahmans and the Anglo-Indians can scarcely be distinguished from each other so far as the 7 characters considered here are concerned

There is considerable admixture with Bihar, the position of Goalas (9th) and Brahmans (8th) being fairly high.

N W P does not show any resemblance. The Punjab castes however occupy high places and indicate either a certain amount of direct contact or else an indirect similarity arising out of the resemblance subsisting between Anglo-Indians and the Bengal Brahmans A comparison based on characters in which Brahmans differ considerably from the Punjab castes is likely to throw light on this point

There is practically no resemblance with the aboriginal tribes of Chota Nagpur, in fact they show a greater dissimilarity with the Anglo-Indians (− 85 2) than with the Brahmans (− 73 6). But the eastern tribes show much less dissimilarity the coefficient for Anglo-Indians being − 25 9 against − 48 7 for Brahmans, − 47 3 for Kayasthas, − 71 5 for Sadgops, − 77 0 for Kaibartas and − 92 3 for Bagdis Darjeeling Lepchas occupy the 13th place which indicates a certain amount of intermixture with the Anglo-Indians

We thus find that the Anglo-Indians included in the present sample are derived (on the Indian side) mainly from the Bengal castes They show a certain amount of admixture with Bihar and also possibly with the Punjab, but not with N W P They are singularly free from contact with the Chota Nagpur tribes, but appear to have intermixed to some extent with the Lepchas of Darjeeling

So far as the present analysis goes we also see that intermixture between Europeans and Indians in Bengal appears to have occurred more frequently among the higher castes than among the lower Evidently cultural status played a considerable part in determining Indo-European union The comparatively high resemblance with Lepchas is also not surprising, their fair colour (as also possibly their freedom from caste restrictions) may have helped intermixture

General Summary of the Analysis

If we assume that physical resemblance is the result of actual intermixture, and that also more or less in quantitative proportion [1] then we may give a coherent interpretation to our results and thus obtain a broad view of the *general tendency* of social history in Bengal

We find that movements of caste-synthesis are proceeding on every side under our very eyes Social barriers and caste restrictions have not been able to suppress it completely The peo-

[1] I would add that physical resemblance may also arise through unauthorised adoption of names of higher castes by person of lower castes (but such surreptitious absorption would in subsequent generations lead to actual intermixture), and also through climatic selection

ples from the north-west have fused with the indigenous stock in Bengal and the aboriginal tribes of Chota Nagpur have intermingled with them. Intermixture within the province has gone on slowly and steadily even if imperceptibly and a larger Hindu Samaj has evolved which is not only not identical with the traditional society of Vedic or classic times but is in many respects even antagonistic. Sectarian obstacles have not proved insurmountable; the Mahomedans who came originally as immigrants have contributed their share and have received back their own contribution from the other castes. The process has not stopped here; it has gone on even after the advent of the Westerners with their totally different culture, history and tradition.

Yet equally striking is the fact that intermingling has not been altogether chaotic. It presents a gradual and well-ordered character in which cultural affinity and cultural selection has played an important part. Horizontal fusion (between low and low or between high and high caste) is more pronounced than vertical intermixture, a fact which serves to conserve the stability of the social system. The Hindu community of Bengal does not on one hand conform to the orthodox scheme of a logically perfect system of rigidly exclusive castes between which no intercourse is ever possible; on the other hand neither does it present an amorphous or chaotic character. It shows a definite structure which has its foundation in clearly marked cultural as well as physical differences, but through these differences the process of synthesis is steadily going on under the influence of cultural and geographical proximity.

Conclusion.

I have given above a piece of straightforward statistical analysis. I have also described some of the anthropological conclusions which may be derived from them. Here I wish to make a distinction. The reliability of the statistical results depends only on the accuracy of the measurements used, the validity of the formulæ employed, and the accuracy of the computation. The statistical results may therefore be called positive in the sense that they are amenable to objective checks. The anthropological results on the other hand partake of a definitely historical character, and their significance and weight depends on the legitimacy of the interpretation of historical and sociological factors of varying importance.

Strictly speaking my own business ends with finding the statistical results; and as I do not profess to claim any expert knowledge in anthropology, I must leave the anthropological deductions for consideration and acceptance or rejection by professed anthropologists.

Whatever may be the value of the particular deductions

given here I believe it would be readily admitted however that a comparison of caste-distances is likely to give us valuable information about caste affinities and connexions, and hence about caste-origins It would therefore be desirable to make an exhaustive comparison of caste-distances for all castes for which reliable data are available

The object of the proposed survey will be to arrange all Indian castes (for which reliable data are available) in a systematic way in accordance with their anthropometric measurements If this systematic classification is once carried out it will be an easy matter to compare and study the connexions between any group of castes with any other

This programme is not new It was formulated in 1911 by Dr. (now Sir) Brajendra Nath Seal, in his address on "Race-origins" delivered before the first Universal Races Congress in London He had stated [1] "If the groups requiring to be arranged vary in n" characters and if biometric measurements are complete, the composite mean of the groups may be taken as the point of origin, and the mean of the single characters for each group may be imagined as marked off on n" co-ordinates, and the position in n-dimensioned space of each group could be easily assigned" The n-dimensional distance between any two castes in this space will then immediately give their anthropometric distance

As a preliminary to the proposed survey it will be necessary to collect and examine all available anthropometrical data for India, and after a careful examination accept for final use only those which may be considered reliable and comparable Neither the proposed survey nor even the preliminary examination of the data can properly be undertaken by a single individual It is essentially a task for a group of workers It would therefore be extremely useful to have a standing committee for Anthropology (in connection with the Indian Science Congress) for this purpose

The first task of this committee will be to prepare a Bibliography of Indian Anthropometry It will then examine the data and publish an authoritative note on their reliability and their comparability It should also draw up a standard list of characters with standard definitions for future guidance of field workers in India, and should also indicate areas or castes for which surveys are urgently required Such a Committee will also prove useful in preventing overlapping of field work and may act as a central clearing house for the co-ordination of anthropometric researches in India

[1] *Race Origins*, 1911, *pp.* 7-8

APPENDIX I

I give below short notes on the castes selected for the present analysis.

Bengal.

(1) *Brahmans*, 100. 75 from West Bengal and 25 from East Bengal (24 Perganas 13, Calcutta 12, Nadia 10, Burdwan 9, Dacca 7, Barisal 5, Faridpur 5, Khulna 4, Bankura 4, Jessore 4 and a few other places). The great majority belong to the *Rarhi* group with a sprinkling of *Varendras*

(2) *Kayasthas*, 100 Traditionally Sudras (the fourth caste) and servants of the Brahmans, now culturally in the same class as the Brahmans (Jessore 13, Dacca 13, 24-Perganas 8, Faridpore 8, Nadia 8, Hugli 7, Bakarganj 7 and a few other places)

(3) *Sadgops*, 48 (mainly from 24 Perganas 23, Midnapore 7, Hugli 5, Burdwan 4 and Birbhum 4)

Originally cowherds they have now taken to some of the minor professions and trades and enjoy a fairly good social status Water and sweets are taken from their hands by higher castes

(4) *Kaibartas*, 100 A cultivating caste, the *chási* or cultivating section of which is *Jal acharaniya* 92 belonged to West Bengal (24 Perganas 22, Midnapore 19, Hugli 17, Nadia 8, Howrah 7, Murshidabad 6, Calcutta 4, and a few other places)

(5) *Rajbansi*, 100, all from North Bengal (Rangpur 53, Jalpaiguri 24, Dinajpore 18) Believed to be the remnants of an aboriginal race, the Koches of North Bengal, they have become Hinduised and have adopted the Bengali language According to one view they are a Mongoloid race that entered Bengal from the east by way of the Brahmaputra valley, others consider them to be descended from a Dravidian stock

(6) *Pod*, 100 (of whom 99 were residents of 24-Perganas) Originally a fishing caste, a large number have now become agriculturists or petty shopkeepers They are not *Jal-acharaniya* and their touch defiles They may be served by washermen but as a rule not by barbers They generally abstain from beef, pork or fowls. Socially they rank very low.

(7) *Bagdis* 100 (of whom 99 came from West Bengal 24 Perganas 30, Hugli 24, Burdwan 11, Bankura 10, Howrah 5, Birbhum 5, Murshidabad 4) Believed to be of aboriginal descent Originally fishermen many of them are now agricultural labourers or *palki*-bearers Some of them eat beef and pork, but there are others e g, like the sub-caste *Tentuliyas* who abstain from prohibited flesh. Their social rank is very low and although admitted within the pale of Hinduism they are almost on the border land

(8) *Mal Pahari*, 100 (of whom 98 belonged to Santal Perganas and 2 to Birbhum) A Hinduised section of the Pahari or hill tribe of Santal Perganas They speak a form of corrupt Bengali but their Hinduisation is not yet complete, and they are ranked among the lowest of the low

(9) *Mali*, 100 (98 from Santal Perganas and 2 from Birbhum) An aboriginal tribe allied to the Chota Nagpur group

(10) *Mahomedans*, 185, all from East Bengal, (Mymensingh 58, Dacca 38, Faridpore 34, Chittagong 27, Tippera 13, Pabna 8, Noakhali 5, and Barisal 2)

(11) *Lepcha*, 57 (Darjeeling 48, Sikkim 8, and Napal 1) They are the aboriginal inhabitants of the hill districts of Darjeeling and Sikkim; about 250 years ago they were driven out into the lower valleys and gorges by the Tibetans They are a timid and peaceful people, very fond of their native woods They have intermarried to some extent with the Limbus and Sikkim Bhotias who both rank higher in the social scale

(12) *Magh*, 100 (Rangamati 82, and Chittagong 18) It is a name which is commonly applied to the native inhabitants of Arakan particularly those bordering on Bengal or residing near the sea.

(13) *Chakma*, 100 (all from Rangamati and Chittagong) An aboriginal tribe

Chota Nagpur

(14) *Bhuiya*, 100 individuals chiefly from Lohardaga 86 Hazaribagh 10, and Santal Pergana 4

They are believed to be of Dravidian ( ) origin and are a respectable class of cultivators, some of whom are small landholders They are partially Hinduised and have adopted many Hindu rites and customs

(15) *Kurmi*, 100 individuals from Manbhum 92 Lohardaga 6 and Hazaribagh 2

They are petty agriculturists with a very humble social position and are not *Jal-acharaniya* Risley believed them to be a Hinduised branch of the Santals but they may even be of non aboriginal descent It appears fairly certain however that they are entirely distinct from the Kurmis (of Bihar and U P) whose social position is considerably higher

(16) *Munda* 100 individuals from Lohardaga 96, Singbhum 3 and Hazaribagh 1

They are an aboriginal tribe having universally admitted precedence over other tribes

(17) *Oraon* 100 individuals from Lohardaga

They are believed to have come originally from Southern India

(18) *Santal*, 100 individuals mainly from Santal Parganas 87 Manbhum 4, Birbhum 3, Midnapore 6 and adjoining districts

An aboriginal caste who have penetrated more than others into Bengal and are getting partially Hinduised but have not yet been admitted within the pale of Hinduism

Bihar

(19) *Brahman*, 100 individuals collected from all over the province (Shahabad 9 Saran, 6, Monghyr 8 Darbhanga 5, Gaya 5 Bhagalpore 4 Champaran 4, Mozaffarpur 4 Allahabad 3 and other places)

(20) *Goala* 100 individuals from Shahabad 25, Saran 20 Champaran 11, Patna 11 Bhagalpore 8 Gaya 8 Darbhanga 6 Mozaffarpore 7 and a few other districts

Traditionally cowherds they have now taken to agriculture and occupy a respectable position in Hindu society

(21) *Dosadh*, 100 individuals from Gaya 56 Monghyr 11 Bhagalpore 11, Darbhanga 8, Patna 8, and other districts

They are mostly labourers menials, swineherds, and are despised by Hindus generally and rank a little higher than Chamars

(22) *Dom* 100 individuals mainly from Champaran 28 Saran 26, Gaya 22, Patna 12, and a few other districts

They breed pigs, supply fuel for burning dead bodies, eat prohibited food and occupy a place at the very bottom of the social scale

North-Western Provinces (*United Provinces of Agra and Oudh*)

(23) *Brahman*, 100 (Gonda 42, Sultanpore 17 Fyzabad 10 Partabgarh 10, Rae Bareilly 6, and a few other districts)

(24) *Kayastha*, 100 individuals from all over the province (Lucknow 9, Bareilly 8, Shahajpore 6, Benares 6, Agra 6 Jaunpore 5, Sultanpore 4 Hardoi 4, Aligarh 4, Allahabad 6, and many other districts)

They are better educated than any other caste in this province and own a considerable amount of landed property They rank next to the Brahmans in social position

(25) *Goalas*, 100 individuals from all over the province (Hardoi 12, Bahraich 11, Fyzabad 10, Lucknow 8, Bareilly 6, Partabgarh 6, Gonda 6 Sitapur 5, and other places)

They are graziers by tradition but have now taken to cultivation They enjoy a fairly high position in Hindu society but come after the Kayasthas

(26) *Chamars*, 100 individuals widely distributed in the province, (Fyzabad 13, Bareilly 11, Agra 9, Hardoi 8, Partabgarh 7 Shahajpore 6, Bahraich 5, and other places)

They are leather workers by tradition but many of them work as agricultural labourers, some of them own small pieces of land Their social position is very low.

(27) *Dom*, 100 individuals from Gorakhpur 32 Azamgarh 15, Benares 14, Ghazipur 12, and other districts

They are believed to be of aboriginal descent and in some districts are considered to be a criminal tribe They come at the very bottom of the social scale almost on the borderland of Hindu society

Punjab

(28) *Khetri*, 60 individuals from Lahore 25 Guzrat 6, Amritsar 4 Gujranwala 3, Gurdaspore 3, Multan 3 Peshawar 3, Jullunder 3, and other places Recognised to be of good social status

(29) *Pathans*, 80 individuals from Peshawar 48, Bannu 15, Kohat 11, and a few other places

Although a rather heterogenous collection they probably represent true north-western characteristics

(30) *Chuhra* 80 individuals from Lahore 56 Amritsar 6, Sialkot 5, and other places

They are a class of agricultural labourers, village menials and scavengers and occupy a low position in society

APPENDIX II

Out of the measurements given by Risely I have selected 15 (10 absolute measurements and 5 indices) for which I possessed fairly reliable values of variability The following Table gives the mean standard deviations for 15 characters

TABLE OF VARIABILITIES

No	Character	S D.
1	Nasal Index	6 86
2	Naso-malar Index	2 92
3	Cephalic Index	3 36
4	Fronto-zygomatic Index	2 74
5	Vertico-cephalic Index	3 00
6	Stature	5 38
7	Nasal height	2·88
8	Nasal breadth	2·51
9	Bimalar breadth	4 52
10	Nasomalar breadth	6·40
11	Cephalic length	6·30
12	Cephalic breadth	5 00
13	Frontal breadth	3 71
14	Bi-zygomatic breadth	4 50
15	Height vertex-chin	10 00

In constructing the above table I used from 30 to 40 samples of Indian castes, each consisting of about 100 individuals. Standard deviations were obtained by direct computation in every case and may be considered fairly reliable.

Mean Values. The mean values were directly calculated in every case and where in agreement with (i.e. not differing by more than 0·1 from) mean values given by Risley, the latter were accepted for use. In cases of discrepancy individual measurements were carefully scrutinised and checked through indices, and were suitably corrected, and new mean values were worked out on the basis of such corrected measurements. A list of such reconstructed mean values (differing by 0·2 mm. or more from Risley's values) used in this paper is given below:—

(1) *Bengal.*
Brahman. Fronto-zygomatic index (81·6).
Sadgop. Bizygomatic breadth (127·9).
Rajbansi. Nasal index (76·8). Nasal length (49·1).

(2) *Darjeeling Hills.*
Lepcha. Cephalic Index (80·9). Cephalic breadth (148·7). Nasal length (52·0). Nasal breadth (36·5). Nasal index (70·4).

(3) *Punjab.*
Khatri. Height vertex to chin (217·3).

(4) *Behar.*
Brahman. Nasal index (73·0).

(5) *Chittagong hills.*
Chakma. Height vertex to chin (219·8).
Magh. Nasal breadth (39·1).

(6) *North West Provinces.*
Kayastha. Nasal length (44·7).
Dom. Nasal index (83·2). Head length (182·9). Head breadth (136·4).

Mean values for Anglo-Indian. Stature 165·7 cm. Head Length 182·3 mm., Head Breadth 142·6 mm., Cephalic Index 78·1. Nasal Height [illegible] mm., Nasal Breadth 35·6 mm. Nasal Index 71·9.

APPENDIX III

STATISTICAL DEFINITION OF CASTE DISTANCE (D)

If M_1 is the mean value of any character (say, nasal index) for one caste and M'_1 the corresponding mean value of the same character for a second caste, then $M_1 - M'_1$ gives the difference between the two castes for nasal index i.e. for the particular character considered. We are however not concerned with single characters; we wish to find the difference between the two castes as a whole, based on a number of characters, that is, we wish to take into consideration not only $M_1 - M'_1$ (say, nasal index) or $M_2 - M'_2$ (say, cephalic index) or $M_3 - M'_3$ (say, nasomalar index) etc. taken singly, but all of them taken together. It is obvious however that a difference of, say, one centimetre in head length is a far more serious matter than the same difference in stature, that is the relative importance of $(M_1 - M'_1)$ or $(M_2 - M'_2)$ is not the same for all characters. It will be therefore necessary to reduce them to some common unit. The standard deviation (s_1, s_2) of the characters concerned may be selected to furnish this unit, so that dividing $(M_1 - M'_1)$ by the corresponding standard deviation s_1 and $(M_2 - M'_2)$ by s_2 etc. we reduce the differences to the same statistical basis. These reduced

differences can then be compared *inter se* or added together. As some of the differences will be positive and others negative it will be desirable to get rid of the algebraic sign. We therefore take the squares of the reduced differences and adding together for all the different characters we get the expression

$$\left(\frac{M_1-M'_1}{s_1}\right)^2+\left(\frac{M_2-M'_2}{s_2}\right)^2+ \ldots \left(\frac{M_p-M'_p}{s_p}\right)^2$$

Taking the mean value for 'p' characters we have

$$D=\frac{1}{p}S\left(\frac{M_1-M'_1}{s_1}\right)^2$$

as a first (provisional) measure of caste distance.

It should be observed here that $s_1, s_2, s_3 \ldots$ should clearly be given the average value of the standard deviations obtained from a large number of different castes. The Table in Appendix II gives provisional values based on my own analysis of from 30 to 40 Indian castes and tribes.

The *Coefficient of Racial Likeness* of Prof. Pearson is defined as

$$C=\frac{1}{p}S\left(\frac{nn'}{n+n'}\right)\left(\frac{M_1-M'_1}{s_1}\right)^2-1$$

$$=\left(\frac{nn'}{n+n'} \cdot D\right)-1$$

when the number of individual measurements is the same for all characters in the same sample.

When the size of the sample is constant for all samples, the two coefficient D and C are very nearly proportional to each other.

The Probable Error of C (Pearson's C.R.L.) has been calculated in every case from the corrected expression (given by Pearson in Biometrika XVIII. Vol. I and II, p. 104) $\pm 0.6745\sqrt{\frac{2}{p}}$, where p is the total number of characters used for the comparison.

Note added 20th August, 1927. I may note here that the coefficient D used in the present paper is essentially of the same type as the "Differential Index" proposed by H. E. Soper, and used by T. A. Joyce in his "Notes on the Physical Anthropology of Chinese Turkestan and the Pamirs" (*Jour. Roy. Anthropological Inst.*, *XLII, 1912, p. 450*). Soper's coefficient is defined as the sum of (the difference in Means divided by the S.D.), and therefore differs from my D in certain respects. They are both in agreement however about not taking the size of the sample in consideration.

Since writing the present paper I have worked out a coefficient which I believe is theoretically preferable to the one used here. In the present notation it may be written as

$$D'=\left[\frac{1}{p}S\frac{(M_1-M'_1)^2}{s_1^2}\right]-\frac{n+n'}{n \cdot n'}$$

$$=[D]-\frac{n+n'}{n \cdot n'}$$

with variance given by

$$\Sigma^2_{D'}=\frac{4}{p}\left(\frac{n+n'}{n \cdot n'}\right)[\bar{D}]+\frac{2}{p}\left(\frac{n+n'}{n \cdot n'}\right)^2$$

where $\bar{D}$ is the mean value of D'. It can be shown that this mean value $\bar{D}=0$ for two random samples taken from the same population

It will be noticed that the new coefficient (D') differs from the present one (D) by a small correcting term $(n+n')/nn'$ but is connected with Pearson's C.R.L. $[C]$ by the simple relation:—

$$D' = \left(\frac{n+n'}{nn'}\right) [C]$$

Although I consider the new coefficient D' to be preferable to D, I have not altered the figures in this paper for two reasons. The correcting terms are quite small (usually about −0.02, the maximum value being about −0.03), so that the conclusions will not be appreciably affected. And secondly, the paper was given as an address on a particular occasion; I have therefore thought it proper to leave the contents practically unchanged.

APPENDIX II.

POSITIONAL INDEX.

We can compare the relative position of any sub-group, say, the Bengal castes, with the help of a simple positional index described below.

Each of the Tables I, (1)—(7) consists of 29 castes, the average position of a caste is therefore ½ (29 + 1) that is, 15. Out of these 29 castes, 8 castes belong to Bengal. If all these 8 Bengal castes occupy the first 8 places then the average position of the Bengal castes would be ½ (8 + 1), i.e. 4.5. On the other hand if the 8 Bengal castes occupy the last 8 places then average position would be 25.5. The total range of variation of average position is thus (25.5 − 4.5) = 21.

Out of this amount (15 − 4.5) = 10.5 is the range above the average position of all castes and (14 − 25.5) = −10.5 is the range below the average position of all castes. Now in actual fact the average position of Bengal castes will be somewhere between 4.5 and 25.5. Let the average position of Bengal castes be a. Then $(15 - a)/10.5$ will give a quantitative measure of the relative position of the Bengal castes in the whole list.

The general formula is very simple. Let "n" be the total number in the whole list and "m" the number in any sub-group and "a" the observed average position of the sub-group (obtained by adding together the serial position of each of the castes belonging to the sub-group and dividing by the total number of castes in the sub-group).

The mean position of the whole group is then ½ $(n+1)$. If the m castes in the given sub-group occupy the first m positions in the list, their average position i.e. "a" will be ½ $(m+1)$. If they occupy the last m positions "a" will be $n - \frac{1}{2}(m-1)$. In actual practice "a" will be somewhere between these two limits i.e. the range of variation of "a" will be $(n-m)$. The positional index may then be defined as

$$P = \frac{n+1-2a}{n-m} \times 100$$

When the "m" castes occupy the first "m" places, the value of "a" will be $(m+1)/2$ and P will become +100, and when they occupy the last "m" places, "a" is $n-(m+1)/2$ and P will be −100.

APPENDIX V

In supplementary tables (8·1)–(8·4) I give the average values of C and D and certain indices based on such average values. For example in Table (8·1) for the Bengal Brahmans the average value of D for seven Bengal castes (line 1) is ·500, while the average for all castes (line 7) is 1·246. In Table (8·2) a corresponding index is shown for facility of comparison. If "A" is the general average for all castes, and "a" is the average for any subgroup, then the index used here is defined as $\left(\frac{A-a}{A}\right)\times 100$. In the present example, $A=1\cdot246$, $a=\cdot500$, and therefore the index

$$=\left(\frac{1\cdot246-\cdot500}{1\cdot246}\right)\times 100=+59\cdot8$$

Tables (8·3) and (8·4) give similar figures for C (Pearson's C.R.L.). It will be noticed that the three tables (8·0), (8·2) and (8·4) give very similar results.

Table 8 (3) Average values of C (Pearson's C. R. L.)

		Brahman	Kayastha	Sadgop	Kaibarta	Bagdi	Malpahari	Mahomedan	Anglo Indian
1	Bengal (7 or 8)	24·3	12·7	4·8	7·1	20·5	72·5	33·1	17·7
2	Bihar (4)	36·2	29·7	13·9	16·2	29·0	75·1	11·9	37·0
3	North Western Provinces (5)	81·1	76·2	36·5	51·4	50·2	80·8	93·2	102·4
4	Punjab (3)	25·6	30·6	13·0	45·8	13·2	132·3	58·2	23·1
5	Chota Nagpur (7)	99·3	75·8	44·5	39·1	24·1	24·2	69·3	131·5
6	Eastern Districts (3)	84·8	74·3	42·5	52·6	77·6	75·5	116·7	81·6
7	General average	50·2	51·5	25·6	33·5	39·0	70·8	60·5	72·6

Table 8 (4). Indices based on average values of C

		Brahman	Kayastha	Sadgop	Kaibarta	Bagdi	Malpahari	Mahomedan	Anglo-Indian
8	Bengal (7 or 8)	+51·2	+75·0	+81·2	+78·8	+47·4	−2·4	+45·3	+75·6
9	Bihar (4)	+27·8	+42·3	+45·6	+52·4	+25·6	−6·1	+80·3	+47·8
10	North Western Provinces (5)	−61·1	−47·8	−43·7	−54·1	−28·7	−11·3	−54·0	−41·1
11	Punjab (3)	+49·0	+1·7	−28·8	−36·7	−87·7	−86·8	+3·8	+68·2
12	Chutia Nagpur (7)	−97·8	−47·2	−34·7	−1·6	+38·2	+65·8	−14·5	−108·6
13	Eastern Districts (3)	−68·9	−44·3	−66·0	−86·8	−98·9	−6·6	−92·8	−12·4

A Preliminary Report on Injection Experiments with special reference to the Production of Alkaloids and general Metabolism in Plants.

BY S KRISHNA *and* H CHAUDHURI

INTRODUCTION

It is a well-known fact that in very closely related plants, differences exist regarding the production of alkaloids; for example in the Opium Poppy (*Papaver Somniferum*) a considerable quantity of morphine and berberine is present, whereas in the Red Poppy (*Papaver Rhaeas*) practically no alkaloid is produced Similar differences exist in the production of scent and colour, as in *Lathyrus odoratus* and *Lathyrus aphaca* and in different species of *Delphinium*, etc

As far as the authors are aware, with the exception of some work on colour production in certain flowers, no systematic attempt has hitherto been made to explain these differences The present note deals with an attempt to find out the causes that produce such differences and to test whether such differences are due to the metallic elements that are present in plants or to some physiological nature connected with the protoplasm The role of metals is suspected to be catalytic in nature, and since different metallic catalysts, starting from the same elements, will synthesise different organic substances (for example essential oil, colouring matter, alkaloid, etc), it is probable that the introduction of a suitable metal or non-metal either in seeds or in plants will produce such differences as have been given above With this idea in view, these experiments were conducted during last winter and spring in Lahore This work is far from complete or conclusive, but as some interesting results were obtained, this preliminary note is published with a view to bringing these to the notice of other workers in this line

Experimental plants —Seeds of the following plants were obtained and cultivated in pots under control

Plants with difference in alkaloid -

Papaver somniferum.
Papaver Rhaeas, and
Argemone mexicana.

Plants with difference in colour of the petals. —

Delphinium (white, rose and blue),
Mathiola (red and white)

Linum (blue and red)
Hyoscymus (black and white)

Method and procedure.—The seeds of the plants were analysed qualitatively for even the minutest traces of metals and certain non-metals present. Three grams of dried seeds were taken and ignited carefully and the residue was then analysed qualitatively for acid and basic radicals. The depth of colour obtained for various radicals indicated whether traces or greater quantities of it were present. The quantitative work has been left for future communication. The following table shows the results thus obtained:—

	Fe	Al	K	P	S	Mg
Delphinium, blue	traces	traces	nil	traces	much	traces
do. white	do.	nil	nil	much	much	much
do. rose	do.	traces	nil	much	much	much
Hyoscymus black	traces	nil	traces	much	much	traces
do. white	traces	nil	nil	much	traces	traces
Linum blue	traces	traces	nil	much	much	traces
do. red	traces	traces	nil	much	traces	traces
Argemone mexicana	much	little				
Papaver somniferum	little	much				
Papaver Rhoeas	V. little	much				

In the first set of experiments the seeds of the plants were treated with different salt solutions (Ferric chloride, ferric nitrate, ferrous and ferric sulphates, aluminium chloride, aluminium nitrate, potassium chloride, sulphate and nitrate, magnesium sulphate, chloride and nitrate). A twofold difficulty was encountered. In many cases the salts were absorbed by the seed coats only, for when the coats were removed no traces of the absorbed solutions were to be found. Again when the seeds were made to absorb the solutions by removing the seed coats or by steeping the seeds in the salt solutions for three or more days, they lost their power of germination. To get over these difficulties injection experiments were carried out. The untreated seeds were germinated and after the plants had grown into seedlings of 4 to 6 inches in height, they were injected by means of hypodermic syringes with colloidal solutions of different metals and certain non-metals which our analyses had shown to be lacking or less abundant. Thus, for example, in *Hyoscymus* white only a very small quantity of Sulphur was present, while in *Hyoscymus* black sulphur was abundant. So *Hyoscymus* white was injected with colloidal sulphur. The following table shows the list of injections carried out in different plants:—

With colloidal iron

Papaver somniferum, *Papaver Rhoeas*
Mathiola red and white

With colloidal aluminium

Hyoscymus black, *Delphinium* rose
Mathiola red and white

With colloidal sulphur

Hyoscymus white *Linum* red
Mathiola red and white,
Papaver somniferum and
Papaver Rhœas

The experiments with colloidal Potassium and Magnesium were not proceeded with

The stems of the plants were injected near the soil level and about ½ to 1 c.c. of the colloidal solution was pressed in very gently and slowly The following strengths were used —

Colloidal iron	..	0·003%
Colloidal aluminium	.	0·001%
Colloidal sulphur	.	0·2%

The injury due to the needle was covered up by painting with a little of collodion solution The plants were examined daily regarding their growth, flowering, seed, production, etc In many cases the injections greatly interfered with the flowering and seed-production and in this respect the effects of iron and aluminium were the most marked Though in many cases the effects of injection were distinctly beneficial as regards growth, the development of the flower bud was very much delayed and in some cases suppressed altogether thus although *Mathiola* white, when injected with colloidal iron produced a number of flower buds, yet these failed to open When one of the control plants, in which some buds had already opened, was injected with colloidal iron it stopped opening the buds

Decided beneficial effects, viz vigorous plant growth and more flowers, were obtained in almost all cases when colloidal sulphur was injected, though the flower buds developed a little late In all the above cases the colloidal solutions were made in conductivity water, and the control plants were left untreated Detailed analyses were carried out of the injected plants of Opium Poppy and Red Poppy regarding the changes, if any, produced with reference to alkaloids The plants (*in toto*) were extracted with solvents (alcohol, water and acetic acid) for the alkaloid and the solutions were tested qualitatively No quantitative work could be undertaken with such small quantities as were at our disposal The following results, though not conclusive, are nevertheless interesting —

Opium Poppy—untreated—a small quantity of berberine found.

Opium Poppy—injected with colloidal iron—traces suspected

Red Poppy—untreated—suspicion of morphine and berberine.

Red Poppy—injected with colloidal iron—traces of berberine found

It will be seen that injection of colloidal iron appears to reduce the berberine in the Opium Poppy, whereas it increases the berberine or rather produces it in the Red Poppy, in which, under normal conditions, practically no berberine is found. This result is far from conclusive but it gives ground to the suspicion that iron in this case acts as a catalyst and we may be able to make the plants produce altogether different organic matters by the simple injection of very small quantities of suitable elements.

It is a pity that *Argemone mexicana* did not flourish sufficiently well in the green house as to give satisfactory results, but the authors hope to carry out the experiments under field conditions and to repeat in the future all the above experiments more fully

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Lunar Periodicity in the Reproduction of Insects.

By SUNDER LAL HORA.

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In recent years[1] considerable attention has been paid to the study of lunar rhythms in the reproduction of certain animals, chiefly marine organisms, but so far as I am aware no observations have hitherto been recorded on the occurrence of such a periodicity in the appearance of the swarms of insects. It is a well known fact that for the sole purpose of reproduction swarms of certain insects, *e.g.*, mayflies, appear for a very limited period at definite seasons. In May-June, 1926, while collecting mayflies at the request of my colleague Dr. B. N. Chopra in the Kangra Valley (Punjab, India), I was greatly impressed by the fact that mayfly swarms (about a dozen or more genera were collected between the 23rd and 31st of May) appeared about the full moon period (full moon date 27th May, 1926), and though on other nights I was generally out in the stream-bed with a lantern no mayflies were collected. After six weeks' observations I was led to believe that moonlight exerts some kind of influence on the emergence of these insects and it is obvious that light would be a great help to the flies in their nuptial dances and in egg-laying. On my return to Calcutta, dates of swarming of several species were collected from different sources, but these data did not help me much. To elicit further information a short note was read before the 14th meeting of the Indian Science Congress in January, 1927, an abstract of which has appeared in the *Proceedings* (p. 199).

To show that a lunar rhythm exists in the reproduction of mayflies, it was necessary to get data regarding the swarms of the same species on more than one occasion, and with this object the dates of the published records were collected and Professor R. A. Sampson, F.R.S., has been kind enough to compute the dates of the nearest full moon in the case of older records.

Müller (*Ent. Mo. Mag.* I, p. 262, 1865) observed the swarms of *Oligoneuria rhenana* Imhoff and remarked that, "The imagos appear at Basle in the first days of September in

[1] Fox, H. M.—*Proc. Roy. Soc.* B, XCV, p. 523 (1923). Fage and Legendre, *Archiv. Zool. Exper.* LXVII, p. 23 (1927). (See bibliography.)

immense numbers," but in the next year (*ibid* , II, p 182) he recorded the swarms of these insects as early as the 25th and 26th of July In 1865, there was full moon on the 5th of September and in 1866, on July 27th McLachlan found the same species in swarms (*ibid* , XVII, p 163) at Basle on the 25th of August 1880 The date of full moon was August 21st From the above observations it seems probable that *O rhenana* swarms about the full moon period

Reaumur observed swarms of *Polymitarcys virgo* from 18th to 22nd of August, 1738 and in smaller numbers on succeeding days (Miall, *Aquatic Insects*, pp 309-314, 1903). The date of nearest full moon was 19th of August In 1883 Desmarest (*Bull Soc Ent France* (6) III p cvii, 1883) found the same species in swarms from the 23rd to 25th of August There was full moon on the 17th of August *P virgo* is thus found to swarm between the last quarter and full moon

Mrs E S Maxwell sent to the Indian Museum specimens of *Palingenia robusta* Eaton from swarms taken on 26th of October 1916 (full moon date 11th October) on October 30th 1918 (full moon date 19th October) and on 25th October 1919 (full moon date 7th November) These records indicate that *P robusta* swarms between the last quarter and the new moon

Needham (*Bull U S Bur Fish, Washington*, XXXVI pp 269-292, 1917-18) has recorded a series of observations on the appearance of *Hexagenia bilineata* in 1916 and remarked that emergence was in waves, that successive waves reached their height at about the 13th 18th, and 23rd of the month with falling away in numbers on intervening dates that subsequent smaller waves culminated on the 10th and the 23rd of August, separated by intervals of entire absence of adults and that belated reappearance occurred on the 2nd and 15th of September " Except for the 18th of July the other dates show a more or less periodic arrangement The swarms that appeared on the 13th July (F M 15th July), 10th of August (F M. 13th August) and the 2nd of September (F M 10th September) were out between the 1st quarter and the full moon , while those that appeared on the 23rd of July, 23rd of August and 15th of September came out chiefly between the last quarter and the new moon The appearance of the belated swarms in September is rather irregular I had associated the emergence of each species of mayfly with a certain intensity of light so Needham's records were rather surprising to me I find, however, that Needham has combined in his *H bilineata* two species recognised as distinct by Walsh (*Proc Ent Soc Philadelphia* II, p 199, 1863) on the colouration of their eyes etc Walsh also observed that in a large swarm only individuals of one type were found. This suggests that either Needham was dealing with two species or *H bilineata* is dimorphic so far as the colour of the eye is concerned On this last factor

probably depends the emergence of the two forms at different states of the moon

While investigating the headwaters of the Nerbadda River (C P) I collected mayflies from swarms from 13th to 16th February, 1927 (F M 16th February) Needham (*Canadian Ent* LIX, p 13, 1927) observed swarms of *Rhithrogena minimus* from 24th to 28th of June (F M 25th June). Collison recorded swarms of mayfly (*Phil Trans Roy Soc*. No 481 p 329, 1746) at Winchester from 27th to 30th May, 1744 There was full moon on the 28th of May 1744 These observations indicate that the mayflies that live in the clear and shallow waters of hill-streams emerge on bright moon-lit nights

At Dalhousie (W Himalayas) I noticed while collecting insects every day with a strong light that a large Tipulid fly came to light for three or four days only about the period of full moon on two occasions.

In the Central Provinces and at Dalhousie I observed swarms of Trichoptera only on dark nights The compound eyes of these caddis-flies are usually small and the males of certain species possess scent-brushes These are probably adaptations for finding mates in the dark

Further observations on insect swarms in relation to the state of the moon are very desirable.

On *Pericrocotus speciosus speciosus* (Lath) occurring in Ranchi District, Chota Nagpur

BY SATYA CHURN LAW.

During my tour in October-November last in the district of Ranchi I was able to collect half a dozen specimens of *Pericrocotus s speciosus* (Lath.), which are now in the Indian Museum I found these not only occurring in small flocks or in pairs in forests or forest-fringes but also on roadside trees somewhat away from them The following are the places where the specimens were shot by me

Place	*Date*
Off Ichadag Hill on Ranchi-Hazaribagh Road ..	9th November 1927
Near Rajadera on Ranchi-Purulia Road .	29th October, 1927
Do	14th October 1927
Fringe of Jonah forests on Ranchi-Purulia Road .	26th October 1927

On a reference to Mr Stuart Baker's Avifauna of British India I notice that Chota Nagpur (within which the District of Ranchi is situated) has been omitted from the range of distribution of this species Mr Stuart Baker writes as follows —

Distribution —The Himalayas from the Sutlej Valley to Eastern Assam, North of the Brahmaputra, The Khasia Hills, across the Northern Kachin Hills into Yunnan

But I find Oates (First Edition, Fauna, British India. Birds, vol. I, page 480) rightly including Chota Nagpur within the range of distribution of this bird There is one other species of *Pericrocotus* whose distribution Mr Stuart Baker records as being in Northern India, extending from the foot hills of the Himalayas as far south as the Central Provinces and Lower Bengal in winter This bird is called *Pericrocotus b brevirostris* (Vigors) Its colouration is so much akin to that of *Pericrocotus speciosus speciosus* (Lath) as might give rise to some confusion as to the correct identification of the two birds But on scrutiny I find the characters distinguishing each other are sufficiently well-marked so as to leave no room for any mistake in identification These characters are :—

Innermost secondaries with oval red drops .	*P. speciosus* ♂
Innermost secondaries with no oval red drops	*P. brevirostris* ♂
Innermost secondaries with oval yellow spots ..	*P. speciosus* ♀
Innermost secondaries with no oval yellow spots	*P. brevirostris* ♀

Besides *Pericrocotus s. speciosus* is larger in size than *Pericrocotus b. brevirostris*. Total length of the former is about 230 mm. and that of the latter only about 180 mm. Maximum measurement of the wing of the former is 106 mm. and that of the latter only 96 mm.

On examination of my specimens I find total length averages 208 mm. and maximum wing measurement is 105 mm. Innermost secondaries in ♂ are with scarlet oval drops near the extremity of the outer webs and in ♀ they are with oval yellow spots on the outer webs. These characters unmistakably establish the identity of my specimens as being *Pericrocotus s. speciosus* (Lath.).

In Mr. Stuart Baker's description of this species (Fauna British India, second edition, vol. II, page 319) I notice some omissions, and one which I consider not trifling I take this opportunity to point out. In adult males he describes the greater wing-coverts as scarlet, but I find they are black at the base, a feature which was rightly recorded by Oates in the old edition, Fauna British India (Birds), page 480. In my specimens I observe that the central tail-feathers in ♂ at this time of the year are invariably with scarlet on the outer webs and with a similar streak at the tip.

A Further Note on the Manuscript Drawings of Fish in the Mackenzie Collection

By SUNDER LAL HORA.

(Published with the permission of the Director, Zoological Survey of India.)

Last year attention was directed (*Journ Asiat Soc Bengal* N S, XXII, pp 93–98) to the fish drawings in that part of the Mackenzie Collection which is now lodged in the library of the Asiatic Society of Bengal. It was pointed out at the same time that there were certain other manuscript volumes in this collection which contained illustrations of Natural History objects While on a visit to London advantage was taken of an opportunity to examine these in the India Office Library and the following account is based on the results of this examination

The India Office Library possesses two volumes belonging to the Mackenzie Collection which contain Natural History drawings One of these corresponds with and is designated as "No 4 on p cexxiii of the catalogue of the collection by H H Wilson, (p 581 of Ed 2, Madras, 1882)" The contents of this volume as stated on the first page of the volume have already been given (*l c*, p 94 footnote), but I wish to make it clear that a "drawing" really means a plate each of which contains several illustrations Thus there are seven plates of fishes, containing 24 illustrations representing 21 species The species represented are the same as those listed already (*l c*, pp 96-97) with the exception of *Kanduka*. There is a slight difference in the numbering of these drawings as compared with those in the library of the Society For example Nos 3 and 20 of the India Office Library are Nos. 4 and 21 respectively of the Society's Library, and *vice versa* It may here be remarked that the date and place of collection of the fish illustrated in drawing No. 21 of the Society's collection are the same as those of the drawing No 20

The second volume contains "Natural History and Botanical Drawings" There are 74 plates in this volume which are distributed as follows —

Mammals	10
Birds .. .	16
Fish	14
Crustacea (prawn)	1

Spider	1
Insects	3
(Several forms)	1
Reptiles	18
Mermaid	1
Plants	9

Of the 14 plates of fish 8 are devoted to a *pallachee* fish of Mavillapooram a specimen of which is said to have been found among rocks on the shore in December, 1816. The description of it is given as follows. "The skin of the lower part of Pallachee is tough and covered with small prickles like shagreen of a light brown colour, the teeth project forwards, the jaw bones are seen distinctly and the skin a little inclined to sink, *the skin about the anus is black* and only about an inch from the tail which is small and stiff like that of other fishes—the ears are similar to a man's of that size, and the sides from whence the belly projects out is of the same tinge as the back" (The italics are mine.) A specimen 1 foot 7¼ inches was collected at Mavillapooram. I think *pallachee* is *Tetraodon stellatus*, for in this species the anus is surrounded by a very distinct black ring.[1] *Diodon hystrix* is called '*Moollu plachay*' in Tamil (Day, *Fish India* p. 708) but the figure leaves no doubt that *Pallachee* is a *Tetraodon*.

Another species of *Tetraodon* occupies two plates in this collection. One plate contains the lateral and the dorsal views of an *Echeneis*, probably *E. naucrates*. Two plates are devoted to *Pterois russellii* and the last plate to a Trygonid ray, probably *Trygon kuhlii*.

It may be of interest to record that with the illustrations of mermaids there is a spirited article in the volume showing that such animals do exist.

Zoological Department
University of Edinburgh
April 1928

[1] NOTE BY EDITOR. On the other hand the species figured may be *Tetraodon hispidus* and the account of the distribution of the small prickles and the reference to the "ears" agrees better with the characters of this species than with those of *T. stellatus*. R.B.S.S.

Aśvaghosa and the Rāmāyaṇa

BY C W GURNER

The Sanskrit poems of the Buddhist scholar and poet Aśvaghosa have usually been studied in their bearing on Kalidāsa rather than in relation to the earlier epics The Polish scholar Andrzej Gawronski has drawn attention to this latter aspect in notes on the Buddhacharita and the Saundarananda and has made a brief intensive study of the influence of the Ayodhyākanda of the Rāmayana on the Buddhacharita He points out the similarity in the narratives of the departure of Rama to the forest with the subsequent return of Laksmana alone to the desolate city, and of the departure of Siddhārtha with the return to the city of Chandaka the charioteer The parallelism is emphasised by direct references in the Buddhacharita, especially in Sarga VIII to the story of the Rāmāyana four of which relate to the Ayodhyākānda Finally a number of verbal reminiscences leave little doubt that Aśvaghosa was acquainted with the standard text of the Ayodhyakānda as we have it to-day

It is the object of the present article to suggest on a rather broader scale the general range of comparison between the Buddhist Kāvyas and the early epics with special reference to the Rāmayana If we accept the postulate that Aśvaghosa's date lies between the earlier epic and Kālidasa the comparison marks a stage in the development of Sanskrit classical literature If the date of the author of the two Kavyas is regarded as still open to question, it has a good deal of bearing on the answer One can attempt no more than the barest sketch with some of the details filled in

The trend of both poems with their motif of renunciation naturally brings them more closely into contact with the Rāmayana With the direct references to that epic Gawronski has dealt in detail There is one however, not particularly

The following are the editions quoted in this article
Ramayana Nirnayasagara Bombay Sak 1830
Buddhacharita Oxford Cowell 1893
Saundarananda Bib Ind Mahamahopadhyaya Haraprasad Sastri, C I E, 1910

Gawronski's notes are in two pamphlets, 'Studies about the Sanskrit Buddhist Literature' (1919) and "Notes on the Saundarananda" (1922) Memoires de la Commission Orientale de L'Academie Polonaise (Nos 2 and 6) I owe my acquaintance with these to the kindness of Professor G Tucci, D Ph

discussed by him, which certainly seems to imply that Aśvaghoṣa was thinking at the moment of some other version of the close of the story than that of the standard epic

तथा महीं विप्रकृतामनार्यैः ।
तपोवनादेत्य ररक्ष रामः ॥
B. IX. 59

Where does this element of misrule, the "corruption by the unworthy" come from The tone of the epic version is different There is the strain of overwork

धुरमेकाकिना न्यस्तां वृषभेन बलीयसा ।
किशोरवद् गुरुं भारं न वोढुमहमुत्सहे ॥
R. VI. cxxviii. 3

but never collapse before the forces of evil It is possible that the reference here is not to the Rāmāyaṇa at all, but to some form of a Daśaratha Jātaka

Two references to Vālmīki are of importance The words

वाल्मीकिरादौ च ससर्ज पद्यम् ।
B. I. 48

may or may not be a direct allusion to the well-known incident in the Rāmāyana

मा निषाद etc,
R II. xv.

The curious word वाल्मीकिनादश्च in Cowell's text, if correct, would leave no doubt about the intention, but there seems better authority for वाल्मीकिरादौ (*Vide* E H Johnston ad loc J.R.A.S., Ap, 1927, p 214) The allusion to Vālmīki as tutor of the two sons, in S 1 26 points unmistakably to the Uttarakāṇḍa At the same time of course neither reference would carry any implication as to Aśvaghoṣa's acquaintance with the mass of legendary accretion in the Bālakāṇḍa and the Uttarakāṇḍa as they now stand, traces of evidence for which will be mentioned later

So much for direct references to the Rāmāyaṇa Before going into the general range of comparison I would touch at this point also on some of the most obvious references to the Mahābhārata, with the object of putting the subsequent notes into their proper perspective It is cited, like the Rāmāyaṇa, in moral instances,

e g

विनाशमीयुः कुरवो यदर्थं ।

B XI 31

and

क्व कार्त्तवीर्यस्य बलाभिमानिनः ।

सहस्रबाहोर्बलमर्जुनस्य तत् ॥

S IX. 17

or recalled quite casually by verbal assonance

स पांडवं पांडववीर्यतुल्यः ।

In both the Kāvyas the legend of Mādrī and Pāṇḍu points the moral of addiction to women

स्त्रीसंसर्गं विनाशान्तं पांडुर्ज्ञात्वापि कौरवः ।

माद्रीरूपगुणाक्षिप्तः । etc.

B IV. 79 Cp S VII. 45

In the allusion to Gautama Dīrghatapas, also occurring in both poems[1] Gawronski finds the influence of the Sabhāparvan of the Mahābhārata, Adhyāya xxi, and moreover shows good reason for believing that the same Adhyāya provided the model for the description of the city of Rājagṛha in the Buddhacarita (B X)

I now turn almost exclusively to aspects of comparison with the Rāmāyaṇa Its influence on Aśvaghoṣa extends to four fields These are (*a*) Stock topics (*b*) Style and Alankara (*c*) Grammar and Vocabulary (*d*) Moral instances I follow this classification

I

Stock Topics.

The poem of Aśvaghoṣa mark a stage in the development of Kavya from a more or less narrative poem to a series of set pieces on conventionalised topics. This tendency may be observed even with the Rāmāyana itself ; and it is not exaggeration to say that, with the exception of technical passages of Buddhist doctrine, the whole range of topics made use of by Aśvaghosa, whether in the main current of his narrative or incidentally, is comprehended in the Ramāyana.

These topics are of two kinds, either descriptive passages of purely literary value, or fragments from the general corpus of standardised Sanscrit learning Without attempting to define the branches of knowledge from which these fragments are drawn in the categories familiar to the writers themselves, it is enough to say that they come from the schools of philosophy, political and military science, ethics and

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[1] Gawr S S B L. pp 27–39

psychology, grammatical and aesthetic theory, and practical handbooks on animals, arms, and other interests of a gentleman's life The duties of a king, the technique of an army, the qualities of good cultured speech the duty of telling unpleasant truths, the moral conflict over the renunciation of vows the pain of separation and consolement in the transitoriness of the world, are commonplaces alike of the Rāmāyana and Aśvaghosa It is significant that they share these commonplaces as a whole but with material of this kind it does not of course follow in the least that any precise allusion in one poem is derived from another They are taken no doubt by both writers direct from the general stock of learning, and it is simply the habit of interspersing these allusions and dwelling now and then to moralise on the narrative that represents the epic influence

The descriptive or literary passages are of more direct bearing on the comparison, and, if I mention generally a few of these parallels to be found between Asavaghosa and the Ramāyana it is with the knowledge that any other reader of both will find material to increase the list The model reigns of Daśaratha and Rama with the illogical but persistent combination of material prosperity general good-will and climatic blessings are echoed in the conditions of Kapilavastu during the reign of Suddhodhana and after the return of the Buddha (R I vi R VI cxxviii 18 ff B II 1-16 S III 30 41) Notice too how the allusion to Manu in R I vi 4

यथा मनुर्महातेजा लोकस्य परिरक्षिता ।

R I vi 4

is repeated in both passages of Asvaghosa The stock description of a city in R I v must have been among the models for that in S I 42 55 The descriptions of the Asram in B VII 32 and S. I 5 17 recall those in R III i 1-9 R III xi 47-52 (Cp R II xcix 12) The types of asceticism detailed in B VII 14-18 look very like an elaboration of the bare list of technical term for ascetics in R III vi 2-5, the

अश्मकुट्टः and the दन्तोलूखलिन

reappearing in the line

अश्मप्रयत्नार्जितवृत्तयोऽन्ये ।

केचित्स्वदन्तापहतान्नभक्षाः ॥

B VII 16

and on the same topic R XII xcii 91-93 and R V xiii 38 ff may be taken more generally into comparison Gawronski has quoted close verbal parallels between Yasodhara's lament in R II. xii, with R II lviii and the parallel passage in B VIII

It may be added that the Rāmāyana is rich in these feminine laments e.g., Tārā's in R IV xx and R IV xxiii, and Sītā's again in R V. xxv, xxvi xxviii The mere practice of piling them up, due sometimes possibly to accretion, is worth comparison with the trio of laments in B VIII, and one catches echoes from them not only in this passage but also in Sundarī's lament over her desertion by her husband S VI 13–24 The occasional feminine sarcasm with which the pathos is heightened (B VIII 34 64; S VI 17) has a flavour of Sītā's tongue "परुष वाक्यम्" (e g R III xlv 21 27) Sundarī it may be added, follows the woman's way with her ornaments just as Kaikeyī had been taught to do at a crise de nerfs

सुवर्णेन न मे ह्यर्थो न रत्नैः ।

R II ix. 59

Cp

न भूषणेनार्थो मम संप्रतीति ।

मा दिक्षु विक्षेप विभूषणानि ॥

S VI 28

Occurring in such passages of the Rāmāyana, but not confined to them is the motif which reappears in well known passages of Kālidāsa that of the contrast in human fortune between royal enjoyment and ascetic endurance, between delicate nurture and harsh exposure and this too Aśvaghoṣa appears to have taken over from the Rāmāyana with his usual elaboration of the descriptive element The simple pathos of

भूमिपालात्मजो भूमौ शेते ।

R II lviii 6

develops into

प्रचेरितास्त भुवि तस्य मूर्धजाः ।

B VIII 52

with a string of epithets to emphasise the contrast (Cp R II xcix 31 ff R II xxiv 3 etc B VI 28) The weeping horse of Siddhārtha is a quite definite verbal reminiscence of a striking little coincidence between Vālmīki and Homer

बाष्पमुखा मुमोच च ।

B. VI 53

Cp

उष्णमश्रु विमुञ्चन्तो ॥

R II lix 1

The animal-faced demons of Māra, armed with trees and stones recall on the one hand the hosts of Rāvana and on the other the weapons of the apes The long descriptive passage

वराहमीनाश्वखरोष्ट्रवक्त्राः । etc ,

B. XIII. 19

suggests the usual verbal reminiscence of a simpler origin

यक्षैश्च नानाविधघोररूपैः ।

व्याघ्रोष्ट्रनागेन्द्रमृगाश्ववक्त्रैः ॥

R VI lix 23

In the same Sarga too Asvaghosa shows that curious interest in describing a loud noise, such as the shout of an army, which runs from the Rāmāyana through the classics (e g R VI. xlii 38 etc B XIII 52 ff)

In the Buddhist writings one gathers that there is an appreciation of nature which is different in spirit from that of Sanscrit thought, but in his poem Aśvaghosa remains bound by the traditions of the medium in which he is composing The mountain scenery and heavenly gardens into which the Buddha leads Nanda (S X 4-14 and 18-31) recall passages in the epic which set the style in the painting of nature and supernature, for the later Kāvyas, e g the mountains in R V lvi 26 50 and the gardens in R VII lxii 1-16 (Though it remains to be discovered from what source Asvaghosa took his extraordinary birds)

The interpretation of nature in the terms of human passions is again, a special theme which dominates classical Sanscrit literature from Kalidasa to Jayadēva It occurs in certain passages in the Rāmāyana the most remarkable being the 'Seasons' in R IV xxviii, and R IV xxx, and before one could make much progress with this subject one would have to form some idea as to how far this theme can be held to occur in the original stratum of the epic That in itself would be an extensive enquiry, but in the aggregate there can be little doubt that such passages do occur, if not in Vālmīki's original, at any rate in an earlier stratum of literature than the Buddhist writers in Sanscrit It is to this interpretation of nature in the terms of passion that Aśvaghosa has recourse, for instance, in accentuating the restlessness of Nanda on his first following the Buddha

अशोकमालम्ब्य स जातशोकः ।

प्रियां प्रियाशोकवनां शुशोच ॥

S III 5

There was a good deal of past history about the Śrngārarasa before it could find expression in so artificial a line as that.

A good instance of the influence of different strata of the Rāmāyana on Asvaghosa will be found in the parallel,

pointed out by Cowell, between the women asleep in the palace of Suddhodhana and those in the palace of Rāvana B V 47–63 and R. V x 30–49 Cowell's citation is only one of three passages with the same theme in the Rāmāyana the other two being R. V ix 33–36 and R V xi 29–36 There can be little doubt, I think, firstly that the passage in the ninth Serga of the Sundarakanda is itself an elaboration of that in the tenth, and secondly that both were in existence in the Ramāyana as known to Aśvaghosa. He takes off in his description at the same point as the tenth Sarga

अभवच्छयिता हि तत्र काचिद् . . .

अंकगता विहाय वीणाम् ।

B V. 48

Cp

काचिद्वीणां परिष्वज्य सुप्ता ॥

R V x 37

and runs through much the same catalogue of musical instruments with the same sensual implications The imagery and compound structure of the passage is, however more reminiscent of the ninth Sarga, from which one simile appears to be taken direct

गजभग्ना इव कर्णिकारशाखाः ।

Cp B. V. 51

गजेन्द्रमृदिताः फुल्ला लता इव ॥

R V. ix 47

Moreover the phrase

उपगुह्य परस्परं विरेजुः

B. V. 54

and the slight Saphoism

वनितालिङ्ग्य सखीमिव प्रसुप्ता ॥

B V 55

are reminiscent of the tangle of womanhood described in one of the most vivid passages of the epic,

ऊरुपार्श्वकटीपृष्ठमन्योन्य यस्य समाश्रिताः ।

R. V ix 61

The shortest passage of the three R V xi 29–36, whether an earlier stratum again than that in the tenth Sarga, or a contemporary repetition, is absorbed by the other two, and, beyond setting the key,

पद्मिनीनां प्रसुप्तानां रूपमासीद्यथैव हि ।

R V xi 36

is of no immediate reference to Aśvaghoṣa's poetry. The essential point of the whole comparison is that here there are at least two strata of distinctly Kāvya writing in the Rāmāyana, and that Aśvaghoṣa shows signs of influence by the later as well as by the earlier

One of the small incidental topics which can be traced from the Ramayana through Aśvaghoṣa to Kalidāsa is the festival of Indra's banner The allusion is worth attention in detail through its suggestive bearing on the relation of the early epic and of Aśvaghoṣa to the drama The very frequency with which it occurs in both the epic and in Aśvaghoṣa is significant (See R II lxxiv 36 R IV. xvi 37 and 39 R IV xvii 2. R IV xxxiv 3 R V ii 59 R VI xxii 54. R VII. xxi 44 and in Aśvaghoṣa B I 63 B III 12 B VIII 73 S III 25 S IV 46) Cowell suggests that it connects Asvaghosa with Western India but it is obvious that this imitative allusion in Asvaghosa may well be devoid of any local significance The topic is mentioned in the same way by both writers to illustrate two points of feeling, the sense of dejection and collapse at the end of the festival symbolised in the fall of the banner, and the general elation when the banner is raised In one case at least the allusion is in direct imitation of its use in the Rāmayana[1] The father of Siddhartha collapses on hearing of his son's departure, "like Indra's banner at the end of the festival" just as Dasaratha had done in similar circumstances (B VIII 73 R II lxxiv 35) Again

देवानुयानध्वजवत् पपात ।

B III 12

echoes the cadence of

प्रभ्रष्टितेन्द्रध्वजवत् क्षितिं गतः ॥

R IV xvi. 39

The picture of the banner when raised in

समुद्दिध्य हेममणिजालवलयिनम् ।

recalls the

S III. 25

स्वलंकृत इव ध्वजः ।

R IV xviii 3

and carries on in turn to the नवाभ्युत्थानदर्शिन्य of Kālidasa Ragh IV 3 Now Indra's banner had some special association with the Drama[2] (Bharata N S I 54) Aśvaghosa himself was a dramatist and there are traces in his Kāvyas of the theory of dramatic Rasa *e g* the incidental identification of वीर्य and उत्साह in S XVI 94 and 97 In what degree does the frequency

[1] Cp Gawr S S B I p 30

[2] Cp also Mohamahopadhyaya Haraprasad Sastri C.I.E., in T P., A S B, V 351 Keith Sanskrit Drama p 41

of the allusion to Indra's banner in the epic and in Asvaghosa imply a mentality permeated with dramatic as well as epic tradition ?

II

Style and Alankara.

The style of Asvaghosa is a curious mixture of naive effort and artificial embellishment At one time he builds up his lines in well-knit descriptive phrases which on the one hand lack the harmony of the later Kāvya while on the other they are distinctly reminiscent of the structure of the more elaborate descriptive passages in the epic style At another time he spends his energy in pounding out a long series of nouns or verbs as if nothing mattered but emphasis While throughout runs an incessant stream of anuprasa, yamaka, and simple puns typical of an early stage in the development of Alankāra. In particular Asvaghosa seems mentally incapable of using a name or addressing a person without some punning allusion either to the name, or to the character of the person which may or may not have a special bearing on the context

The result of all this is to produce a style differing widely in its total effect from that of the epic, but all the leading features of which can at the same time be instanced from the epic On the penchant for anuprase and puns I need not dwell When Asvaghosa indulges passim in phrases such as

कृत्स्न कृत मे कृतकार्य्यं कार्य्यं ।

S XVIII. 10

कुलस्य नान्दीजननश्च नन्दः ॥

S IV 6

any reader will agree that the epic of रामाभिराम and रावण लोकरावण has not been without its influence on him That universal word पद्म provides an excellent instance of Aśvaghosa's intermediate position Such a line for instance as

काचित्पद्मवनादेत्य सपद्मा पद्मलोचना ।

पद्मवक्त्रस्य पार्श्वेऽस्य पद्मश्रीरिव तस्थुषी ॥

B IV 36

is exactly the kind of case in which Aśvaghosa amplifies an echo from the epic in a fashion which marks a development of style, but might be condemned as insipid by the more cultured standards of the later Kāvya. Incidentally this Sloka well illustrates the habit of repeating himself which gives so academic a tone to Aśvaghosa's style It should be read with S VI 26 for which Gawronski quotes R V xv 21 and R VI xxxvi 8.

leaving no doubt about the influence of the Rāmāyaṇa on this passage

Or consider the feature of laboured construction, which as a whole it would be difficult to bring under any category of alankāra, but which one appreciates in Aśvaghoṣa, and of which the germs can be found in the epic. Take such a line for instance in the Rāmāyana as

वहन्ति वर्षन्ति नदन्ति भान्ति ध्यायन्ति नृत्यन्ति समाश्वसन्ति ।

नद्यो घना मत्तगजा वनान्ताः प्रियाविहीनाः शिखिनः प्लवंगाः ॥

R IV. xxviii 27

and note the double characteristic of piling up verbs and nouns and the distributive grammar, each verb standing in relation to its own noun Then carry the principle on to the distributive simile in the Rāmāyana

सीताकपीन्द्रक्षणदाचराणाम् ।

राजीवहेमज्वलनोपमानि नेत्राणि ॥

All these elements are to be found often in a rather more elaborate stage, in Aśvaghoṣa's usage There is the simple piling up of verbs in

ररोद मम्लौ विरुराव जग्लौ बभ्राम तस्थौ विललाप दध्यौ ।

S VI 34.

The principle of grammatical distribution is applied in the relation of instrumentals to objectives in

श्रवणाग्रविमीलनात्मभावान् ।

वसनस्पर्शवपुर्गुणैश्चकार ॥

B V 42.

It finds expression again in the distributive simile

गजमेघवृषभबाहुनिस्वनाक्ष

B V. 26 Cp B. XII 116

And finally this simile is itself elaborated with distributive oblique cases

अग्निद्रुमाज्याम्बुषु या हि वृत्तिः ।

कबन्धवाय्वग्निदिवाकराणाम् ॥

S XVII 59 Cp. B. IX. 16

We have travelled some way from the simpler epic features, but the course of evolution is obvious

One of the stylistic problems of the Rāmāyana lies in the elaborate similes, of a more or less allegorical character, which are embedded in the simpler texture of the epic narrative. In some cases they can be shown with fair certainty to be later than their surroundings, but this is not always the case; and even when they are of a later stratum it does not necessarily follow that this was subsequent to the time of Aśvaghosa. Derived no doubt from the allegorical mysticism of the Upanishads this type of simile was peculiarly adapted to the speculative interest of the Buddhist writer Starting from common ground with the epic, such as the conception of the Fire of Sorrow, or the Sea of Sorrow, he gives to it a distinctly doctrinaire or ethical value; and it is the one type of literary artifice which comes more frequently into use as he goes more deeply into his exposition of Buddhist doctrines in the concluding Sargas of the Saundarananda. Take for instance the Fire of Passion, and the Fire of Sorrow in the Rāmāyana

तद्वियोगेन्धनवता तच्चिन्ताविमलार्चिषा ।

R VI v 8

चिन्तावाष्पमहाधूमः तवागमनचिन्तजः ॥

R II xxiv 7

and compare these two with the Fire of Sorrow in the Buddhacharita

शोकाग्निना तद्विरहेन्धनेन निश्वासधूमेन तमःशिखेन ।

B. IX. 29

The similes are not sustained by Aśvaghosa point by point in the same details, but the general influence is clear For the Sea of Sorrow one may compare R. II. lix 27–31 and B I 75. The conventional Wheel of the Law in S. III 11 represents the fusion of this literary tradition with orthodox Buddhist doctrine

There is a quite different type of elaborate simile in Aśvaghosa, not allegorical, but purely a picture simile, such as the white-robed maiden asleep with her flute resembling the foam-flecked river with bees and lotus. B V 49 This type too one can see developing in the more sophisticated passages of the Rāmāyana, but the comparison would be too discoursive for the present purpose.

It is hardly possible to exaggerate the extent to which Aśvaghosa is indebted to the epics for the stock similes and rūpakas of his literary repertoire. He is in fact speaking their language, with its illustrations from lotus and creeper, sun, moon and the stars, lightning and clouds, ships buffeted at sea, and travellers astray on land. A special study might be made of what I would call the "similes from consciousness and

conduct" which this introspective writer frequently uses, and deliberately piles up in certain passages, *e.g* , B XIII 46-51 They turn on the relation of soul and senses, capacity for education, observance and neglect of moral duties, with the consequence in attainment or loss of merit, and generally on topics of psychology and ethical and religious duties One can probably recognise the personal factor in the prominence given by Aśvaghosa to this kind of illustration, but it is to be found already scattered unobtrusively through the Rāmāyana *e g.*, R V. xxviii. 12, R. V. xxix 1 R VI. lxiii 3 and 6 The obscure grammatical simile in S XII 9, 10, which is imitated by Kalidāsa (Ragh. xv 9) recalls the grammatical pedantry which appears so out of place in the narrative of the epic

रकारादीनि नामानि

R III. xxxix 18

The recourse to Indra, his consort, and his court for illustrations of royal majesty conjugal well-being relations of father and son, of priest and monarch, is a commonplace taken from the epic style And it is worth noticing that this trait becomes most marked in the seventh book of the Rāmāyana, where incessant similes from Indra and his company replace the imaginative fertility of the earlier kandas

Two occasional features of style in which Aśvaghosa shows the influence of the epic are the rhetorical hyperbole

रविमंशौ पतेदपि ।

B IX 68 Cp S VIII 42

Cp R III xxxvii 37-54, etc

and the rhetorical repetition of the concluding pada of a Sloka B VIII 46 B XI 23, Cp R V xlii 18, etc Even the trick of repeating the same word in different senses, on which Aśvaghosa deliberately exercised his ingenuity to the despair of his reader, as in the second Sarga of the Saundarananda is not without a simpler parallel in the Rāmāyana

परस्परं चाधिकमाक्षिपन्ति भुजांश्च पीनानधिविक्षिपन्ति ।

मत्तप्रलापानधिविक्षिपन्ति मत्तानि चान्योन्यमधिक्षिपन्ति ॥

R V v 11

The doubling of the gerundive verb to emphasise slow or repeated action is another of the small mannerisms which may be traced from the Rāmāyana

विश्रम्य विश्रम्य पुनः प्रयन्ति ।

R IV xxviii 22
Cp R II xlii 12

through Aśvaghoṣa

संचिन्त्य संचिन्त्य ।

S VI 27 Cp S VII 37

to the classical writers

विश्रम्य विश्रम्य वनद्रुमाणाम् ।

Bhartr S S 21

III

Grammatical and Verbal Resemblances

It is hazardous for the reader not trained in the traditional Vyakaran to touch on the grammatical comparison of Asvaghosa and the epic There would be general agreement however that, whether it is the result of his natural position or of conscious archaicising, the grammatical usage of Asvaghosa stands between that of the epics and of Kālidāsa, and, of the two, he is perhaps a trifle nearer to the former than to the latter Moreover, both in the process of restricting certain liberties of grammatical structure and of perpetuating one or two mannerisms, one seems to witness the same process of evolution towards the classical standards Without attempting to enter deeply into these grammatical problems I would adduce a few obvious resemblances

Of the hall-marks of the epic style Asvaghosa has dropped the unaugmented past tense, but, if the manuscripts are correct, he preserves traces of the Arsha Sandhi

दित्सन् पितृभ्योऽम्बु इवावतीर्णाः ।

S X 10

भूरिद्युम्नो ययातिश्च एते चान्ये नृपर्षभाः ॥

S XI 46

It would obviously be unwise, however, to rely on the limited manuscript authority for a small point like this.

In the syntax of verbs Asvaghoṣa's flexible use of the infinitive presents certain points for comparison with the epic The construction with a noun, for instance, is of an archaic character

न कालः परिशोचितुम् ।

R V lxvii 26

कालो हि मे यातुमयम् ॥

B I 73 Cp B V 70

The grammatically remarkable line

प्राप्तकाल प्रवेष्टुं मे सत्य साधयितुं महत्

R V iii 34

with its combination of infinitives of suitability and of purpose might serve as text for a good many of the uses of the tense in Aśvaghoṣa while from the other side Aśvaghoṣa's line

नन नैव क्षमं द्रष्टुं नराः स्त्रीणां स्त्रीणां नराः ।

B IV. 95

with its passive personal infinitive dependent on क्षमम् is reminiscent of usages in the Rāmāyana For the impersonal infinitive with क्षमम् one may compare

इति वक्तुं कथं क्षमम् ।

R. II. xlvii. 9,

and कथ क्षमं वेत्तमह ममेति ॥ [वक्तुम् ?]

S IX 36

(Incidentally it may be added that the multifarious meanings and uses of the adjectival क्षम in the neuter and in other forms in Aśvaghoṣa bears more resemblance to the epic than to later practice)

In the use of the cases one may refer particularly to the instrumental This case in epic usage is loosely controlled and invested with a peculiar degree of independent force in the sense of description or accompaniment, which is toned down in the later classics Aśvaghoṣa's use of the case is more sparing and artistic but certainly shows the influence of the epic tradition Take for instance the line

क एष भोः सूत नरोऽभ्युपेतः केशैः सितैः ।

B. III. 28

Classical canons would incline to interpreting the instrumental as dependent on the participle, but cadence and context alike show that केशैः सितैः is a descriptive adjectival phrase "Who is this old man approaching, with white hair?" (Cp. विलंबिते प्रयातुम् just above) The piling up of instrumental cases, so common in the descriptive passages of the epic passes into classical tradition, but not this strong independent force; and a line such as

निपीडयिष्यामि भुजद्वयेन ।

विभूषणेनार्द्रविलेपनेन ॥

S. IV. 36

"while the ointment is still wet" points distinctly backwards to what may be called the descriptive instrumental absolute.[1]

[1] Mr C H Johnston has however since given me the reading निर्भूषणेन based apparently on better Manuscript authority

नेत्राभ्यामश्रुपूर्णाभ्यां सुमन्त्रमिदमब्रवीत् ।

R. II. xxxix. 9.

The simultaneous use of instrumental and ablative *metri gratia*, when no difference can be detected in their meaning, was branded as a definite fault by the classical critics. Aśvaghoṣa, apparently, was aware of nothing wrong with it in the "काव्यधर्म" which he was following, and here too his practice is in accordance with the epic tradition Compare

भावज्ञानेन हावेन चातुर्याद्रूपसंपदा ।

Cp B IV 12. Cp B IV. 26, etc.

and

पराक्रमेण वीर्येण तेजसा सत्त्वगौरवात् ।

सदृशा ह्यत्र दर्पेण रावणस्य दुरात्मनः ॥

R VI. xxxvii. 22.

These notes on the infinitive and the instrumental are obviously the merest suggestions on the material available Other general lines of resemblance might be found in following out the use of the non-descript case ending in तस्' and of the adverbial वत् Both these details are of much more frequent occurrence in Aśvaghoṣa than in the later writers, and his freedom in handling them contributes to the archaic effect of his style. More easily pointed out are small grammatical mannerisms, in which are to be found precise echoes of the epic. Such for instance is the use of this case ending in तस्' with a verb of motion in the sense of forming an opinion

अशुभं शुभतो गच्छसि ।

S VIII 48

न माम् दोषतो गन्तुमर्हसि ॥

R. VI. civ. 13

(though Aśvaghoṣa generally uses a verb of sight with तः in this sense). Again the double adverbial particle क्व च ...... क्व च, which has made a niche for itself in literature in one well-known passage of Kālidāsa Raghu I 2, can be traced on its way from the Rāmāyana through Aśvaghosa. There is a parallel in its use for contrast between royalty and asceticism which is a particularly good example both of Aśvaghosa's imitative method and of his elaboration on the epic style

क्व चारण्यं क्व च क्षात्रं क्व जटाः क्व च पालनम् ।

R. II. cvi. 18

विमानप्रख्यमाहं फि सौकुमार्यमिदं क्व च ।

............तपोवनमही क्व च ।

B. VI. 18.

And one may quote also its use for personal relationship.

क्व च जनसंवासः क्व च नीचपराश्रयः ।

R. VI. lxxxix. 14

क्व चात्मक्षिरर्थि सास्य पूर्वं ।

त्यागः क्व चायं जनवत् क्षणेन ॥

S. VI. 19.

Compare another forcible instance in S X 71.
The कदा of hope deferred which is well established in the classical tradition, (e g Kadambari p. 128 Bombay ed. कदा मे समयागम etc.) has a similar history

कदा नु खलु सुश्रोणी द्रक्ष्यामि ।

R. VI v 12. Cp. R. III xvi 40.

आरण्यकं द्रक्ष्यामि नन्दं...कदेति ॥

S. XVIII. 33.

A more trivial mannerism is the use of वा न वा at the end of a line to denote alternatives, to which Aśvaghosa is particularly prone in his more routine passages towards the end of the Saundarananda

सुखानि यत्नेन भवन्ति वा न वा ।

S IX. 39.

Cp. S X 62.

It recalls the tag यदि जीवति वा न वा which occurs three or four times in the Rāmāyana , and might well stick in the reader's mind for commonplace use (e g R III lx. 14. III- lviii. 11. V xx 26 without यदि,)

In point of vocabulary there are a few words used by Aśvaghosa, and found in the Rāmāyaṇa, which are so distinctive in character that the later writer may be believed to have taken them consciously or subconsciously from this source. Close study of the Mahābhārata would no doubt similarly reveal the provenance of other unusual words चत्वर, something to do with the lay-out of a city, which occurs only once I believe in the Rāmāyaṇa. and puzzles the commentators.

चित्रामष्टापदाकारां वरनारीगणायुतां ।

R. I. v. 16

reappears in a parallel context in the Saundarananda

अट्टायदमिवाखिलम् ।

S. I 32.

The coincidence is of some importance as tending to establish Aśvaghosa's acquaintance with the opening Sargas of the epic in their present form. The word उपचारक in बाह्योपचारक । B. XIII 22, which I previously suspected, seems to be established by पौरोपचारक in R. II. i. 48, however one may interpret Aśvaghosa's adaptation Similarly फलति in the sense of a loud noise

द्यौः फलतीव मत्ता ।

B XIII 52

is paralleled exactly by its use in the Rāmāyana

फलतीवास्य घोषेण गगनं ।

R. V. lviii 18

Cp. R. VI xxii. 6

Less distinctive, but worth quoting, is पृथग्जनः at the end of the sloka in B IX 68 (text probably corrupt somewhere) and, in the same context of the contrast between sinner and saint, in R. IV xxxiv 8 Aśvaghosa's careful distinction of निशाम् "to see" from निशम् "to hear" has a good deal of authority in the Rāmāyana, though there are exceptions. The rather puzzling verb स्तम्भ and विष्टम्भ can be better understood by comparison of instances scattered through Aśvaghosa and the Rāmāyana.

Gawronski[1] notices the frequency in Aśvaghosa and the Rāmāyana of the word वैकृत्यं which, according to him, tends to disappear in the later classics.

IV

Moral Instances

Was it vanity of Sanscrit learning or earnestness of Buddhist teaching, that caused Aśvahosa to introduce into his Kāvya long strings of moral instances from famous names of the past? Not necessarily either. Here too he was carrying on the epic tradition. The Rāmāyana, in passages rather of fervent appeal than of didactic insistence, pauses to dwell on examples from familiar names, such as those of saints who went to Heaven, (R. II. lxiv. 42) or of faithful wives. (R. II. cxviii. 10–12. V. xxiv.9–13.)

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[1] G. N. S. p. 17.

यां गतिं सगरः शैब्यो दिलीपो जनमेजयः ।
नहुषो धुन्धुमारश्च प्राप्ताः तां गच्छ पुत्रक ॥

R. II. lxiv. 42

Aśvaghoṣa, in consonance with the spirit in which he follows the epic, elaborates this type of writing In place of a few lines of incidental references he piles up whole batteries of moral instances to support the argument. He has, of course, a still wider range to draw on than had the epic; for in addition to the epic stock he has behind him the Jātaka legends, that of Sivi for instance being a typical example (S. XI 42 B XIV 30.) Not only so but apparently he does not exclude even quite recently deceased Buddhist divines. At the same time it is characteristic of the rather limited and academic range of his literary powers that his mind is constantly recurring to the same stock examples, and in very much the same language. In fact he is often not fashioning an instance from his epic material, but making use of an old stock instance that had served the epic

And naturally the application of these instances takes on a new philosophic tone Faithful wives interest Aśvaghosa less than deluded saints and erring women, whether adduced as a warning against the frailty of the flesh (B IV. 16–20 and S. VIII. 44-45) or as a temptation to the waverer (B. IV 72–80 and S VII 24–45) Nahusa, named in the sloka from the Rāmayana quoted above, now appears, among a number of other examples, to illustrate not the attainment of Heaven but the transitoriness of the heavenly state as of all other sensual delights (S. XI 42–51 and B. XI. 13–18) Other topics similarly instanced are problems of the religious conscience such as the breaking of ascetic vows, (B X 58–61 and S VII 51) the fulfilment of dharma by royalty (B IX 20) and methods of attaining Moksa (B XII 67) Incidentally it is worth noticing how this essentially didactic method, as it is in Aśvaghosa, becomes of purely literary value, or is perhaps consciously parodied, in a well-known passage of the Daśakumārcharitam, the harlot and the saint, where one of Aśvaghoṣa's instances actually reappears

शचीपतेरहल्याजारता

Dasak. Kale 1917, p 70.

It would obviously be the task of years to fix on the source from which each legend is quoted All that one can attempt to do is to show that the Ramāyana was one of the sources specifically in mind To begin with, many of the names mentioned in the brief passages cited from the epic are scattered through Aśvaghosa's poems in one context or another. But a few more precise parallels may be picked out.

The legend of Indra and Ahalyā for instance, twice referred to by Aśvaghosa as an instance of surrender to the passions, (S VII. 25 and B IV. 72) is an incident in the mass of loosely connected legendary material which swells the Uttarakānda (R. VII xxx); and must surely be part of its latest stratum Aśvaghosa appears to be drawing directly on the legend as here set forth, and not without verbal reminiscence

सा त्वया धर्षिता शक्र कामार्तेन समन्युना ।

R. VII. xxx 30

कामं परमित ज्ञात्वा देवोऽपि पुरंदरः ॥

B. IV. 72.

The household legends of Yayāti and Nahusa occur in the same Kānda, (R VII lix) but cannot be shown to have provided material for Aśvaghosa in the form in which they are there related. All that can be said is that, like the epic writer, he has a peculiar fancy for the two names often in conjunction, (B II 11, B IV. 78. B XI. 14, S. XI. 44 and 46). And what he does definitely adopt from the epic is the use in the earlier Kāndas of Yayāti's fall from Heaven as a stock legendary instance

ययातिमेव पुण्यान्ते देवलोकात् परिच्युतम् ।

R II xiii 1

ययातिरेव राजर्षिः पुरा हित्वा पुनर्दिवम् ॥

R. II xxi 47

Cp also R. III. lxvi 7, IV xvii 9

भूरिद्युम्नो ययातिश्च ....

कर्मभिर्द्यामभिक्रीय तत्क्षयात् पुनरत्यजन् ।

S. XI. 46.

There is a still closer verbal reminiscence in the allusion to Visvámitra and Ghrtácī among the many instances of women and saints

घृताच्यां किल संसक्तो दश वर्षाणि लक्ष्मण ।

अहोऽमन्यत धर्मात्मा विश्वामित्रो महामुनिः ॥

R. IV xxxv. 7

स गाधिजश्चापहृतो घृताच्या समादशैकं दिवसं विवेद ।

S VIII 35

The allusion to Māndhāta seems again to imply knowledge of the Uttarakānda; and at the same time, unless some other

source more relevant can be quoted, is an interesting little case in which Aśvaghosa rather strays from the point in repeating a stock instance Sarga lxvii of the Uttarakānda tells how Māndhāta was deluded by Indra into leaving Heaven to complete the conquest of the world

अर्धासनेन शक्रस्य राज्यार्धेन च पार्थिवः ।

वन्द्यमानः सुरगणैः प्रतिज्ञामध्यरोहत ॥

R. VII. lxvii. 8.

Half Indra's throne was not satisfaction enough The Buddhacarita quotes the legend, with an unmistakeable verbal allusion, to illustrate the insatiability of sensual desire, where it is very much in point

शक्रस्य चार्धासनमप्यवाप्य ।

मान्धातुरासीद्विषयेष्वतृप्तिः ॥

B.XI. 13. Cp. S. XI. 43

The Saundarananda however refers to it in illustration of the transitoriness of the heavenly state, an application which distinctly loses relevance if this is the legend still in mind Sagara, twice alluded to by Asvaghosa (B. I 49 and S I 25) is an important figure in the legendary Sargas of the Bālakāndam, and it may be noticed, leads off the list of successful saints in the Sloka quoted (And incidentally it is worth drawing attention to this tendency of Asvaghosa's to think of the same names, not merely in the same context, but even in corresponding stages of his two poems) Finally one may mention the purely verbal reminiscence in the allusion to the divinity Māyā

मायेव दिवि देवता ।

S. II. 49

निदधे रावणः सीतां मयो मायामिवासुरी ॥

R. III. liv 14.

On the other hand, these points of contact being established, it is surprising to find how far away from the Rāmāyana Asvaghosa is in his allusions to some of its most familiar names, such as Pururavas and Urvasi In such cases he has obviously in mind an entirely different set of legends Gawronski's identification of Gotama Dirghatapas in S. VIII 45 is an excellent case of fixing a rather obscure allusion definitely on to a passage in the Mahābharata Cowell quotes Manu IX. 23 on the reference to Aksamāla and Vasistha in B IV. 77. Such instances to the contrary are a warning against attaching exaggerated importance to these allusions to legends found in the Rāmāyana.

Conclusion.

To sum up, it is sufficiently clear that the Buddhist scholar in composing his Kāvyas was very much under the influence of the epic tradition, and one may say perhaps especially of the Rāmāyaṇa, with its initial theme so akin to his own But the ultimate question about his relationship to the epic stratum of Sanscrit literature, and one on which this bare comparison throws little light, is this Was Aśvaghoṣa carrying on a still living Kāvya-epic tradition, or was he looking back across the dust of ages, and over a great gap in Sanscrit culture caused by Buddhism, to epics which were for him a dead language? Was his position analogous to that of the cyclic poets or even of Aeschylus in the Homeric tradition, or to that of Apollonius Rhodius who wrote a consciously imitative and artificial epic in the grammar schools of Alexandria Close study of the later Kāvya elements in the Rāmāyaṇa might throw some light on this question, which is of fundamental importance for the history of Sanscrit literature.

In conclusion I must express my sense of the imperfection attaching to an article of this kind. It is a subject to be studied piece-meal and not on the grand scale In the great bulk of the Rāmāyana other readers will find other aspects for comparison, and other parallels, many no doubt more apposite, than those I have noticed. And some of these inevitably slip from one's grasp in the course of working the comparison up.

Mymensingh
The 25th Feb., 1928

The Historical Stone Horse in the Lucknow Museum.

By JAGANNATH DAS RATNAKAR

In an article headed "Discovery of a new Historical Stone Horse," published in the Indian Historical Quarterly of December, 1927, a Hindi version of which had previously appeared in the Nagari-Pracharini Patrika Vol VIII, I made an incidental reference to the Historical Stone Horse preserved in the Provincial Museum of Lucknow From a historical point of view, the horse appeared to me very interesting and deserving of more minute and serious attention than has hitherto been paid to it I therefore devoted to its critical study as much of my time as I could spare. The results of my study, as well as the theories and ideas that suggested themselves to me, are embodied in this article for the information and consideration of the scholars of Archæology and Epigraphy Even if my attempt be regarded by the Archæologists and Epigraphists as an undue meddling, I hope they will look upon it with indulgence, as it will have the merit at least of inviting their attention to a hitherto neglected relic of yore and suggesting a key to the decipherment of the so-called conch characters.

Below I give, for ready reference, the informations that I could find about the horse in different books

"Another memorial of the event seems to exist in the rudely carved stone figure of a horse which was found in northern Oudh and now stands in the Lucknow Museum with traces of a brief dedicatory inscription incised upon it apparently referring to Samudra Gupta."

(Vincent Smith's Early History of India, 3rd Ed p 288)

"The fact that the mutilated inscription '———ddaguttasa deyadhamma—' is in Prakrta suggests a shade of doubt All other Gupta inscriptions are in Sanskrta (J R A S , 1893, p. 98 with plate) See Fig 11 in plate of coins The horse having been exposed to the weather, outside the Lucknow Museum for years, the inscription has disappeared The image is now inside the building The inscription was legible when the first edition of this book was published "

(Vincent Smith's Early History of India 3rd Ed . p 288, Footnote)

"The fact that Samudra Gupta actually performed the solemn rite is vouched for by the inscriptions as well as the

reverse legends of the medals. It seems also to be commemorated by a very curious sculpture preserved at Lucknow. This is the life-size figure in stone of a small horse which was dug up some years ago near the ancient fort of Khairigarh in the Kheri district, on the border between Oudh and Nepal. Khairigarh was evidently a place of importance in ancient times, and Gupta coins are found in the neighbourhood The stone horse bears on the right side of its neck an inscription of which the letters '———— dda guttasa deyadhamma—' are legible. The first word must clearly be restored as 'Samudda' and the three words must be translated as 'the pious gift of Samudra Gupta' The sculpture which stands in the open air, at the entrance of the Lucknow Museum, is accordingly labelled as being the sacrificial gift horse of Samudra Gupta."

"The artistic merits of the work, as will appear from the accompanying plate I, prepared from a photograph kindly supplied by Dr. Fuhrer, are contemptible The letters of the inscription are so faintly engraved that they are barely discernible in the original photograph, though the reading appears to be quite certain All other Gupta inscriptions are in purely classical Sanskrta, and it is curious that this brief record should be in Prakrta I do not think that the word 'deyadhamma' is found in any other Gupta record."

(Observations on Gupta Coinage by Vincent Smith, published in the J R A S 1893, p. 98.)

"About two miles north-west of the fort (Khairigarh) stood till 1885 the life-size stone figure of a horse buried in dense jangal, though of a rude workmanship it is nevertheless interesting on account of a fragmentary Gupta inscription of Samudra Gupta being incised on the right side of the neck. The attitude is stiff and the workmanship of the legs is hard, weary and unnatural, but the back is skilfully caparisoned Judging from the inscription, it is meant to be a substitute for a real, but costly, sacrificial horse. The stone horse is now standing in the compound of the Lucknow Provincial Museum"

(Fuhrer Monumental Antiquities of N.W.P. and Oudh, p 285.)

"The earliest relic which can be dated with some certainty is a stone horse which formerly stood in thick jungle two miles from the fort of Khairigarh, and is now at the Lucknow Museum Its attitude is stiff and conventional; but it resembles closely the figure depicted on a rare coin of Samudra Gupta, and a fragmentary inscription mentions that monarch, who flourished in the fourth century A D"

(District Gazetteer of the U.P. Vol XLII. Kheri, p. 135.)

All these extracts with slight verbal differences practically come to the same thing and can be summed up in the following few lines :

A rudely carved life-size stone figure of a small horse was found standing in dense jungle about two miles south-west to the ancient fort of Khairigarh, in the Kheri district of Oudh. It bore on the right side of its neck a mutilated inscription of which the letters ".. ....dda guttasa deyadhamma," could be deciphered The first word was restored as "Samudda," and the whole inscription was translated as "the pious gift of Samudra Gupta." The horse was regarded as a memorial of the Horse-sacrifice of Samudra Gupta. After 1885 it was brought to Lucknow and is now preserved in the Provincial Museum The inscription was legible when the first edition of Mr Vincent Smith's Early History of India was published; but having been exposed to the weather for some years it quite disappeared by the time the book was prepared for its third edition Its being in Prakrta has suggested some doubt to scholars as all other Gupta inscriptions found up to the time are in Sanskrta. The horse resembles closely the figure found on a rare coin of Samudra Gupta There is an artistic engraving on its back which has been regarded by Dr Fuhrer as a skilful ornamentation of the caparison Mr Vincent Smith is quite certain as to the reading of the inscription which was discovered on the neck

Besides the doubt that was created in the mind of Mr. Smith, owing to the inscription being in Prakrta, the fact that an inscription, that could maintain its legibility, under all the inclemencies of weather in the jungle of Khairigarh, for more than 1500 years, should totally disappear in so short a time after that in the Lucknow Museum, also appeared to me somewhat curious I consequently, proceeded to Lucknow and personally inspected the horse and examined the spot where the inscription is said to have existed The result of my inspection and examination is given below.

Besides the information given above, I noted the following additional points in respect of the horse —

It consists of a hard variety of reddish stone and is carved together with the pedestal in one block Its fore legs are joined together by the extra stone left between them and the hind legs are also so The tail is practically destroyed, but it is evident from what is left of it that it was connected to the unremoved stone between the hind legs. In these respects it resembles the Benares horse, described in the article mentioned above. Both of its ears are wanting Nor do they seem to have ever been made in relief. The spots where they should have stood are a little raised and enclosed with lines engraved round them. From this fact it may be inferred that the figure was meant to imitate a horse whose ears had been cut off The facial

appearance is sombre and gloomy as befits a doomed creature. It measures 6′ 11″ by 5′ 2″. It is represented in plate No. 10.

Besides the passages quoted above and the points noted by myself, I could collect no other information about the horse. It is quite possible that an estampage of the neck inscription with some notes about it may be found in some book, but I could lay my hand on no such work.

I looked for the inscription referred to above on the neck, but in vain No trace of any letter could be found on either side of the neck Some indefinite marks could of course be seen But they could well be said to be the marks of the chisel of an unskilful workman My friend, Rai Prayag Dayal Sahib the Curator of the Museum, who has always been good enough to help me in all such matters, however, told me that there were some marks resembling old characters visible on the neck some years ago In an impression of the inscription taken on the occasion some old characters were faintly discernible too But they were quite illegible

Though my curiosity as regards the neck inscription was not satisfied, yet my trouble in visiting Lucknow did not go unrewarded On scrutinising the ornamental design on the back, which was taken to be only a decorative design of the caparison by Dr Fuhrer, and left unnoticed by Mr Vincent Smith and others, up to the present, with the same or similar thought, I was inspired by the idea that it might contain some inscription in ornamental characters of the time It consists of a line of some floral marks in the middle of the back, running lengthwise, from near the loin to near the withers, with some other marks of different shapes and sizes on both sides of the line, and both above and below it (see Plate No 11) The engraving, as a whole, is in a fairly good state of preservation and has well defied the ravages of more than 1500 years. When I communicated my idea to Rai Prayag Dayal Sahib, he said it was probably some pictorial writing or a conch inscription as the archæologists designate it

I tried to decipher the same, but could not do so at the time I then requested the said Rai Sahib to supply me with an estampage of the full engraving on the back of the horse, which he did cheerfully with his usual obliging courtesy. On bringing it home I tried to find out some clue for reading the line but all my attempts failed for the time being.

One day, however while looking at it, an idea struck me that if the engraving was really a floral inscription it must necessarily contain lots of superfluous ornamental strokes, which should be left out of consideration in trying to decipher it. With this idea I concentrated my attention only on the middle line, leaving aside the surrounding strokes which appeared to me to be superfluous and merely ornamental extensions.

This line, which resembles somewhat a chain, seemed to me to consist of six links But then the shapes of these links resembled one another so closely that no advance could be made towards their deciphering. The similarity between the slanting lines both above and below each part led me to think that the idea of their being letters was merely a mistake, and that the engraving was really some ornamental design, for, I thought how could the letters of an inscription be so similar to one another With this idea, I was just about to give up all hope of deciphering the line, nay, even of the possibility of its being an inscription, when my attention was suddenly attracted to the dissimilarity between the middle portions of those similar lines It then struck me at once that those similar strokes were also ornamental portions, and that if there were letters, the portions lying between those similar lines alone could be so With this idea I gave my thought only to the middle portions, discarding even those similar slanting strokes (see Plate No 12)

Having got rid of the ornamental superfluities, all the parts of the line presented marked difference in their shapes, which supported the possibility of their being letters, though still the difference between the first and the second letters was not clearly discernible, and the fourth and the fifth letters appeared to be quite similar In this simplified form though it became fairly certain that the line was some inscription, yet it remained still a puzzle

After repeated attempts at guessing, I was one day led to regard the third letter to be ग (g), (see the Palæography of India Plate 16), and in the light thus received the fourth letter, together with the semicircular stroke beneath it, which was at first discarded as superfluous, appeared to be प्त (pta), (see the same plate) Thus the third and the fourth letters together were guessed to read as गुप्त (Gupta), though the U-vowel mark beneath the ग (g) was still indiscernible

This guess made me pretty sure that the inscription contained the name of some Gupta king Now, having regard to the fact that there were only two letters before the word (Gupta), it was also certain that the word formed by them must necessarily consist of two letters, such as चन्द्र (candra), स्कन्द (Skanda), बुध (Budha), etc But the first letter resembled the च (c) of the Gupta period so closely, (see the same plate of the Palæography of India), that I concluded the first two letters to be चन्द्र (Candra), though there was considerable doubt, at the time, as to the second letter being न्द्र (ndra). But then I could hit upon no other name amongst the Gupta emperors having च (ca) as its first letter. Thus the first four letters were guessed to be चन्द्रगुप्त (Candragupta).

The fifth letter being similar to the fourth it could also

presumably be regarded as प (p). But I could make no definite guess, at the time, in respect of the sixth letter

I consulted my friend, Rai Syam Sundar Das Sahib, about my reading He said it was quite a reasonable guess and might prove to be correct in the end.

I then again proceeded to Lucknow to examine the original inscription more minutely, so that the uncertainty and doubt in the real shapes of the letters, commonly caused by the imperfectness of ordinary impressions, might be removed. In this visit I directed my attention more particularly to those points which were doubtful, and I was glad to find that my guesses were strengthened by the re-examination

I must here express my sense of obligation to Rai Prayag Dayal Sahib, who gave me every facility for examining the inscription and kindly made all necessary arrangements for my studying the same

The forms which the letters presented after a minute scrutiny of the original amply justified my reading of the first four letters as चन्द्रगुप्त (Candragupta), and enabled me to read the fifth and the sixth letters together as पितुः (pituh).

In plate No 12 given with this article, the misleading stone marks have been filled up, and the shapes of the letters and ornamental lines, as determined by the re-examination, have been clearly brought out Besides, for the convenience of the readers, the ornamental lines have been printed in colour, so that the letters may be quite distinguishable from them.

The form of the first letter, as shown in plate No 12 of this article, needs no comment as regards its being च (ca)

The second letter न्द्र (ndra) of this inscription, as shown in plate No 12 differs a little from the न्द्र (ndra) of the Gupta inscription reproduced in plate No 16 of the Palæography of India The upper parts of both of them, representing न (n), are, however, quite similar But their middle portions, forming द (d) differ in form In addition to the difference in the direction of their curves, the lower end of the द (d) in this inscription, after turning to the left, terminates in a small downward stroke , while that of the द (d) in the said Gupta inscription turns to the right The द (d) of this inscription corresponds in shape to that of the plate No 4 of the Palæography of India The र (ra) attached to the lower portion of द (d) in this inscription is somewhat more curved and extended than the र (ra) found thus attached in the Gupta inscription of the Palæography of India This may be said to be due to its occurring in an ornamental writing Moreover, somewhat more extended and curved attached र (ra) is to be seen in plate No. 18 of the said book also

In re-examining the original, a small hook-like turning to the right was discovered in the lower end of the right leg of the third letter ग (g), which might well be taken to be the उ-मात्रा

(U-vowel mark) attached to it, (see the U-vowel mark attached to त in plate No. 16 of P. I.)

As regards the fourth letter being प्त (pta) there was not much doubt even in the beginning I have, consequently, to add nothing to what I have already said about it

Thus my reading of the first four letters as चन्द्रगुप्त (Candragupta) was amply supported and confirmed by the re-examination of the original.

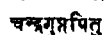
The fifth letter being similar to the fourth, no comment is necessary to identify it with प (p) The curved line, which starting from its middle proceeds upwards inclining to the right and which after a turn has been converted into an ornamental spiral circle, has been taken by me to be the इ-मात्रा (i-vowel mark) attached to प (p) In plate No 16 of the P. I, the Mātrās of इ (i-vowel marks) are no doubt, found inclining to the left, but in the 10th and 20th plates of the I. P. they are seen inclining to the right also

The identity of the sixth letter was in some doubt for a long time Its appearance did not, at first, seem to correspond with any such letter which, in combination with the fifth letter पि (pi), could form a fitting word I was often tempted to regard it as न (t), but the small line in its belly which seemed to be joined to, or to be an extension of, the curved ornamental line over it, proved repulsive to the presumption In the end, however, an idea suggested itself to my mind that the thick line in the belly was neither joined to nor was a part of the ornamental curved line over the letter, it was rather an extension of the small ornamental line which shoots off from the bigger one to the right of the letter, as shown in Plate No 12, and that it seemed separated from the small ornamental line only owing to the stone of the spot being worn out Then on looking more carefully, a small protuberance was also discernible on the top of the letter These facts identified the sixth letter with त (t) The semicircular stroke beneath it was then taken to be the उ-मात्रा (U-vowel mark) attached to it, and the two indistinct dots to the right of the letter were guessed to form the Visarga mark Thus the sixth letter was read as तु: (tuh).

In this way the fifth and sixth letters together were read as पितु: (pituh), and the whole of the middle line as—

चन्द्रगुप्तपितु:

(Candraguptapituh.)

Besides the letters in the line, there are two more letters in the inscription, one over the first and the other over the fourth letter of the line. At first I had thought them to be some ornamental forms. But in my second visit to Lucknow I marked some such figures in a hitherto undeciphered stone inscription preserved in the Museum. I consequently took

them also to be some letters, and applied myself to their deciphering.

The form of the first letter, as shown in Plate 12, leaving aside the arm attached to the right, corresponds to अ (a) of the old characters, (see I. P., plate 16) Now if the arm attached to the right be taken to be the ो-मात्रा (o-vowl mark) attached to it, as seen in plate No 10 of I. P., then the letter may be read as ओ (o) If it can be presumed that the Anuswar vindu (n-sign mark) is merged in the ornamental line, that begins from above the letter, or that it has somehow or other been effaced, then the letter can be read as ओं (Om)

The form of the second letter over the line is that of a horn, of which the top inclines to the left, and which has a horizontal line within it. This may be said to be of the form of स (s) in old writing In the aforesaid plate No 16 though the top of स (s) is seen to be flat and rounded, yet the top is also found pointed in old inscriptions (see plates Nos. 1 and 2, in I. P) The left-ward inclination and horn-like appearance of the letter may be said to be due to its ornamental character There is a curved line attached to the foot of the right side of the letter which advancing to the left meets the ornamental line to its left This can very well be taken to be र (ra) attached to स (s) The curved line, which starts from the top of the letter and advancing upwards becomes an ornamental line running to the left of it, may be regarded to be the ई-मात्रा (ī-vowel mark). (see ī-vowel mark in plate No 19 of I. P). Thus the second letter over the line may be said to be श्री (Śri)

According to what has been said above the reading of the whole inscription may be said to be as follows .—

ओं श्री

चन्द्रगुप्तपितु

Om Sri

Candraguptapituh.

It may be noted here that I am not yet quite sure as to the reading of the two letters over the line

If my reading of the line be regarded as correct and that of the effaced inscription, as deciphered by European scholars Dr Buhler and Mr Vincent Smith also so, then we have to face two difficult questions, requiring satisfactory explanations The first question would be as to who did actually set up the horse, *i e* Samudra Gupta or Candra Gupta, and the second point would be as to why one inscription should be in Sanskṛta and the other in Prakrta

If we regard the horse as having been set up by Samudra Gupta, the father of Candra Gupta, then we are confronted with the curious fact of his designating himself by the name of his son, the general practice being to designate oneself by the

name of one's father and not by that of one's son. If, however, this horse be said to have been set up by Candra Gupta, then the question arises as to why he should have inscribed it as his father's and not as his own A plausible reply to this question would seem to be that the horse was installed by Candra Gupta in memory of his father after his death, and consequently he got it inscribed over with the words 'समुद्दगुत्तस-देयधम्म' ('Samudda guttasa devadhamma') and identified Samudra Gupta as his father. But we have to bear in mind that the stone horse 'resembles closely the figure depicted on a rare coin of Samudra Gupta' or his medal, which raises the presumption that the horse was in existence at the time of striking the coin or medal, *i e*, in the life-time of Samudra Gupta This objection may be met by holding that the figure on the coin was not made after the stone horse, but, rather, the stone horse was made, by Candra Gupta, in imitation of the figure on the coin of Samudra Gupta, to commemorate the Horse-sacrifice, on the occasion of which such coins were struck This would, of course, be a very reasonable reply to the objection But it must be remembered that Candra Gupta came to the throne after the death of Samudra Gupta, when Ajodhya, if not actually the capital of the vast Gupta empire, was one of the most important seats of government, as Mr Vincent Smith has rightly said in his Early History of India So, had the horse been set up by him after his accession, it must have been placed at the capital or some important sacred city, and not at Khairigarh, which, though an important place owing to its being on the border between Nepal and Oudh, could not enjoy the rank of a capital Nor was it any important sacred place

The difference of language and place of the two inscriptions raises the question as to whether the two inscriptions are to be regarded as parts of one and the same inscription or as different ones

If we regard the neck inscription to be in continuation of the back one, then the whole inscription would run thus—

'चन्द्रगुप्तपितुः समुद्दगुत्तस देयधम्म'

'Çandraguptapituh Samuddaguttasa deyadhamma'

On this supposition one-half of the inscription would be in pure Sanskrta and the other half in Prakṛta, which would be repulsive to the established custom. Besides, there would be the unreasonableness of dividing one sentence in two places, inspite of there being sufficient room on the back for both of them If, however, the two inscriptions be regarded as independent of each other, then an explanation is necessary as to why there should be two inscriptions having the same meaning, as the purport of both of them is practically the same.

I venture to make the following suggestions, for the consideration of the experts as affording a satisfactory explanation for both the difficulties

Çandragupta, as we learn from Mr Vincent Smith's history, had made himself an important factor, even in the life-time of his father, both in administrative and military affairs If we now assume that the politically important district of Kheri, with the surrounding country, was placed under his governorship, where he acquired popularity and fame owing to his administrative and military qualities, then both the anomalies may be thus explained When his father performed the Horse-sacrifice he set up in his province, a stone horse, resembling the figure of the horse depicted on the medals, struck on the solemn occasion, in commemoration of the important event, both as a token of his paternal love and as a political step towards raising the dignity and prestige of the empire, in the eyes of his troublesome neighbours. As he was the most renowned and popular personage in the vicinity, he got an inscription engraved on it in Sanskrta, saying that it was his father's चन्द्रगुप्तपितु (Candraguptapituh) Then seeing that the pictorial writing was difficult to be read by the people, as it always is he got another inscription engraved on the neck in ordinary characters and popular language of the time, meaning practically the same thing In this inscription instead of चन्द्रगुप्तपितु' (Çandraguptapituh), he put समुद्दगुत्तस (Samuddaguttasa), and expressly mentioned (deyadhamma), which was understood in the Sanskrta inscription

As regards the horse having been made without ears, I hold the same opinion as I have already expressed about the Benares horse having been made only with one ear

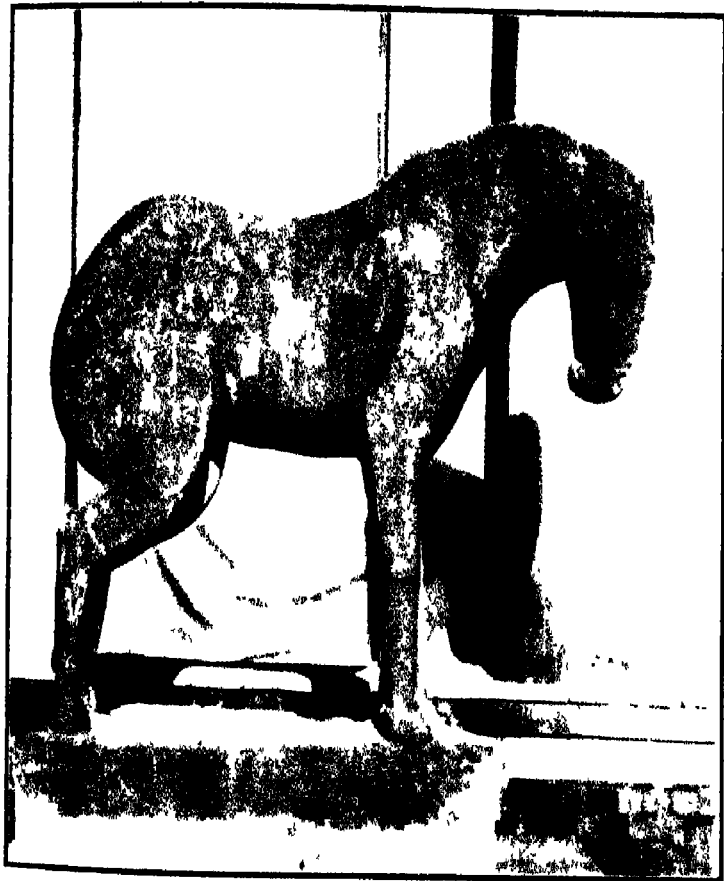
As regards the reading of the neck inscription, I may observe here that though the compound देयधम्म (deyadhamma) is quite a good one yet it is of very unfrequent occurience, as Mr Smith has himself frankly noted So, if we regard the word to be misread for दयाधम्म (dayādhamma), we can have quite an appropriate compound for the sentence, and of frequent use with the Jainas and Boudhas In such a case the inscription would mean 'Samudra Gupta's compassion-duty,' signifying that the earless horse was intended to indicate the compassion which Samudra Gupta religiously cherished towards God's creatures, as showing that, even on the occasion of a Horse-sacrifice, he refrained from destroying the life of an animal

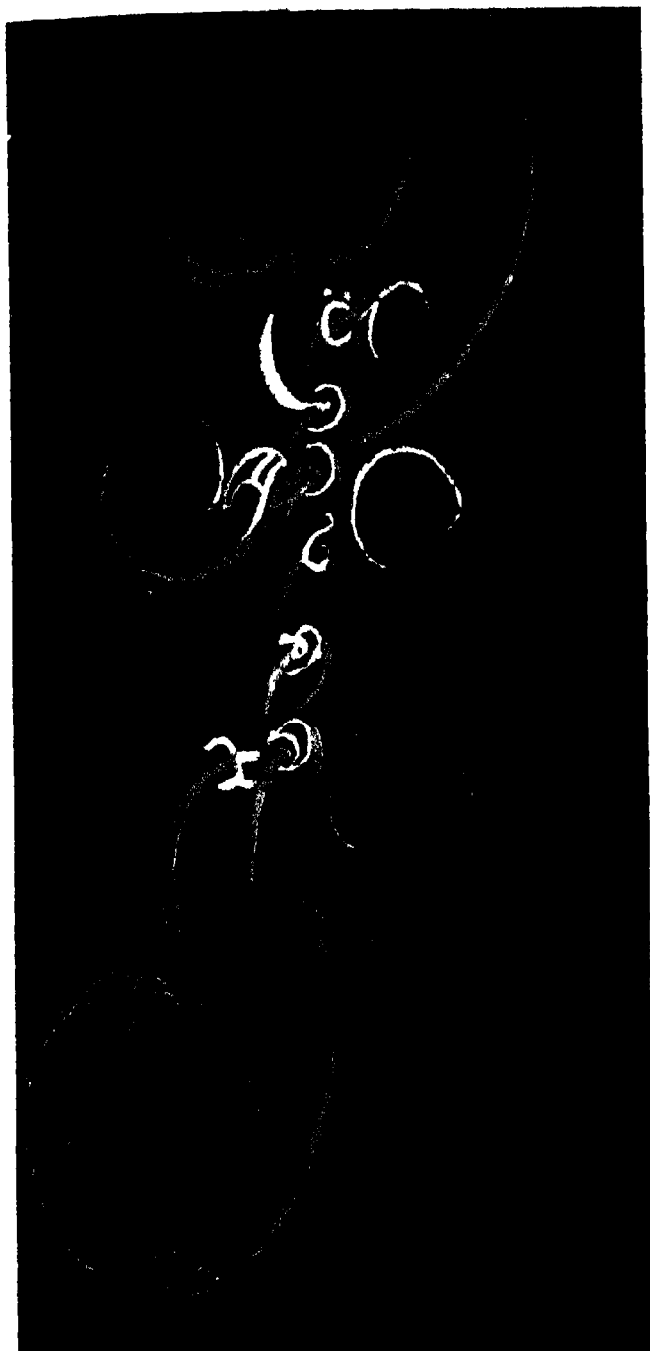
If, however, the reading of Mr Smith be taken to be right, its English rendering as 'pious gift of Samudra Gupta' cannot be said to be quite accurate It should in such a case be 'giving (dedicating or endowing) piety of Samudra Gupta.'

Before finishing the article, I must express my sense of gratitude to my old friend, Rai Śyam Sundar Das Śahib, who

has taken a deep interest in the reading and publishing of the inscription and made valuable suggestions towards the same.

(It may be noted here that, an article on the inscription has already appeared in Hindi, in the Nagari-Pracharini Patrika of Benares, in Vol IX, Issue I)

SHIVALAGHAT, BENARES
12th May, 1928

Stone statue of a horse set up by Samudra Gupta

Mechanical reproduction of the inscription

Reconstruction of the inscription

ARTICLE No. 31.

Ishwarchandra Vidyasagar as a Promoter of Female Education in Bengal.

(*Based on unpublished State Records*)

BY BRAJENDRANATH BANERJI.

If the 18th century saw a revolution in the political history of Bengal, the 19th century saw another and equally far-reaching revolution in our life and thought. This second change has been rightly called the Renaissance of India At the time of the English conquest, not only were our indigenous kingdoms in utter dissolution, but our society also was decayed and our mediaeval civilization was dead. The old order was dead, but the new order did not come into being till seventy-five years after the battle of Plassey, *i e*, in the age of Lord William Bentinck

This beneficent revolution in intellect and morals received its start from Rajah Rammohun Roy. It went on gathering force and volume till it created a new literature, a new faith, a new social organization and a new political life—in short, a new civilization in India.

In the intellectual sphere it took two forms, first the acquisition of the new learning and scientific method of the West, and secondly the recovery of the literature, thought and spirit of our ancient forefathers in their true and pure original form. In both of these fields Ishwarchandra Vidyasagar took a leading part. He was not only the first great critical Sanskrit scholar among the modern Bengalis, he was also the founder of vernacular education on sound modern lines and the creator of the first English college conducted entirely by Indians Great as Vidyasagar admittedly was as a social reformer and philanthropist, he was not less great as an educational pioneer in two very important and untried fields. A study of this aspect of his career from original records is, therefore, a source of instruction to us, who are easefully reaping where he sowed with so much toil and anxiety

The education of Indian women did not form a recognized part of the Government's duties before 1850, although a beginning in this direction had been made by some respectable Indians (notably Rajah Radhakanta Deb) and the Christian missions In 1849, a very successful lay school for girls was opened in Calcutta by Drinkwater Bethune—a great well-wisher of the Indians. It was at first named the Hindu Female

School and afterwards the Bethune Female School. Bethune was fortunate in having Pandit Ishwarchandra Vidyasagar as his co-adjutor and fellow-worker from the beginning During his Presidentship of the Council of Education he had known the pandit as a highly talented and untiring worker, and so he now induced him to accept the Honorary Secretaryship of his institution (Dec 1850). Soon after Bethune passed away on the 12th of August 1851 From October 1851, however, Lord Dalhousie had borne all the expenses necessary for keeping the institution going, and on his Lordship's departure in March 1856 it became a recognized Government institution, supported by the State, and was placed by the Lieutenant-Governor under the superintendence of Mr Cecil Beadon In his letter dated 12th August 1856, Mr Beadon submitted a scheme to the Bengal Government, proposing certain measures as likely to bring the character and objects of the school more prominently to the notice of the higher classes of the Hindu community, and to induce them to educate their daughters in this institution The appointment of a Committee was also suggested, including among its members Rajah Kalikrishna Deb Bahadur, Rai Harachandra Ghose Bahadur, Babu Ramaprasad Roy and Babu Kashiprasad Ghose Mr Beadon was anxious to secure the services of Vidyasagar as Secretary to superintend the affairs of the Bethune School. He remarked in his letter to the Lieut.-Governor:—

> "It may be thought by His Honour no less than justly due to the past services and distinguished position of Pandit Ishwarchandra Sharma to appoint him Secretary to the Committee."[1]

The Bengal Government gave its assent to the proposal Mr Beadon was elected President and Vidyasagar Secretary of the Committee.[2]

Like Drinkwater Bethune, Vidyasagar was a staunch advocate of female education as a means of improving the condition of his countrymen But his zeal and activity were not solely confined to the Bethune Female School

The Home authorities, in the famous Education Despatch of 1854 and elsewhere, had expressed the intention of giving full and cordial support to female education, and early in 1857 Halliday found himself in a position to take up the problem of the establishment of female schools in Bengal. He sent for Vidyasagar, then the Principal of the Calcutta Sanskrit College and an Assistant Inspector of Schools, South

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[1] Letter from C Beadon to W. Grey, Secretary to the Government of Bengal, dated 12th August 1856 —*Education Con* 4 September 1856. No. 166

[2] Bengal Government to C Beadon, and to Vidyasagar dated 30th August 1856 —*Ed Con.* 4 Septr 1856, Nos 168 & 170

Bengal, and had a free discussion with him on the subject. They fully realized the difficulty that was then to be expected in attempting to establish a female school, the chief obstacle being the reluctance with which respectable Hindus could be persuaded to allow their girls to attend a public school Vidyasagar, however, felt that, by energetic exertion, he would be able to enlist the sympathies of the people in such a good cause

The Pandit was soon able to report the opening of a girls' school at Jowgong in Bardwan He made an application for a monthly grant on its behalf, as will be seen from the following letter which he wrote to the Director of Public Instruction on 30th May 1857 —

> It is with great pleasure I have the honour to report that the inhabitants of Jowgong in Bardwan have at the suggestion of the Head Master of the Model School at that village established a female school there It was opened on the 15th of April last and now musters on its rolls 28 girls of different ages, ranging from 4 to 11 years, the majority of whom are daughters of respectable Brahmans and Kvasthas of the place The school is at present located at the dwelling house of Babu Nabagopal Mazumdar the most influential man of the village and opens in the mornings when the Head Master of the Model School, assisted by another, performs the duties of teachers The establishment of the institution was intimated to me at the commencement, but as I felt doubtful about its stability, I did not think it proper to report the circumstance to you at that time Having however visited it during this week I have been led to hope that there is every chance of it flourishing within a short time Not only do the inhabitants take the liveliest interest in its success, but the girls themselves appear to prosecute their studies with great delight and attention Arrangements for the management of the school are, therefore, urgently required, and I beg to submit them in the accompanying tabular statement for your sanction
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> "It will be seen that in the statement I have applied for two pandits as, under present circumstances, I do not think the school can be properly managed with a less number It is true that the number of girls is only 28 but as each girl has a separate lesson to learn, one man cannot conveniently teach them all The contingent charges have been estimated at Rs 5 per month This sum includes the cost of class-books which it is intended to supply gratis to the pupils, because the inhabitants claim the same privilege in this respect as that allowed in the Bethune School " [1]

TABULAR STATEMENT

			Rs
Female School at Jowgong, Zila Bardwan ·	Head Master	.	25
	Asst. Master	..	15
	Maidservant	..	2
	Contingencies	.	5
		Rs.	47

[1] *Education Con* 22 Oct 1857, No. 72

However, it seemed to the Director that two masters were unnecessary for the school,—at all events in its first stage—and after a personal conference with the Pandit, he recommended to Government a monthly grant of Rs 32 for the institution

Some months before this the Director had submitted to Government three applications of a similar nature, dated 18th March 1857, received from Mr Pratt, the Inspector of Schools, South Bengal, for grants-in-aid to three female schools, which were proposed to be established at Dwarhatta (thana Haripal) and Gopalnagar (thana Baidvabati) in zila Hughli, and at Narogram in Bardwan [1] The Lieutenant-Governor sanctioned monthly grants for the support of all the female schools in question, the inhabitants of the villages undertaking in each case to provide a suitable school-building In sanctioning these grants the Lieutenant-Governor desired to be informed of any other applications for grants-in-aid to female schools which the Director might have received from the Divisional Inspectors "as he would be glad to have them submitted for his favourable consideration " [2]

The attitude of the Bengal Government towards the education of Indian women appeared to the Pandit to be encouraging He had already put the Model Vernacular Schools for boys into working order, and now directed his attention chiefly to opening female schools He naturally assumed that his plan—similar to that followed in the case of the Model Vernacular Schools for boys—had generally been approved by Government, and under this impression he opened a number of female schools in the districts under his charge As usual he reported the opening of the schools to the Director of Public Instruction and applied for monthly grants. That officer, in accordance with previous instructions, sent up the Pandit's applications, along with others, to the Lieutenant-Governor for consideration.[3]

Between November 1857 and May 1858 Vidyasagar established 35 female schools with an average total attendance of 1,300 girls The following is a list of the villages where these schools were located, the dates on which they were opened, and the monthly expenditure involved in maintaining them [4] —

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[1] D P I to the Govt of Bengal, No 384 dated 1st May 1857; No 709 dated 9th July 1857 —*Education Cons* 22nd October, 1857, Nos. 68, 71 For Mr Pratt's letters, *ibid*, Nos 69, 72.

[2] Govt of Bengal to the Offg D P I., dated 21st October 1857. - *Ed Con* 22nd Oct 1857, No 74

[3] Letter from the D P I to the Govt of Bengal, dated 15th Feby. 1858 For the tabular statement, see *Ed. Con* 24 June, 1858, No. 167C.

[4] *Education Con* 5 August 1858, No 16 See also *Ed. Cons* 24 June 1858 Nos 167 A and B, H-I-K-L, *Ed Con* 2 Decr. 1858, No 5

HUGHLI ..	Potbah	. 24 Nov , 1857	..	Rs 29
	Daspui	.. 26 ,, ,,	..	,, 20
	Bomchi	.. 1 Dec ,,		,, 32
	Digshooi	.. 7 ,, ,,		,, 32
	Talandu	.. 7 ,, ,,		,, 20
	Hatinah	. 15 ,, ,,	..	,, 20
	Hovera	. 15 ,, ,,	.	,, 20
	Nopara	.. 30 Jany, 1858	..	,, 16
	Udairajpur	.. 2 March ,,	..	,, 25
	Ramjibanpur	.. 16 ,, ,,	..	,, 25
	Akabpur	.. 28 ,, ,,	.	,, 25
	Shiakhala	. 1 April ,,	..	,, 20
	Mahesh	.. 1 ,, ,,	..	,, 25
	Birsingha	.. 1 ,, ,,	.	,, 20
	Goalsara	. 4 ,, ,,	..	,, 25
	Dundipur	.. 5 ,, ,,		,, 25
	Daypur	. 1 May ,,		,, 25
	Raujapur	.. 1 ,, ,,	.	,, 25
	Malaipur	12 ,, ,,	..	,, 25
	Bishnudaspui	.. 15 ,, ,,	.	,, 20
BARDWAN	Ranapara	. 1 Dec 1857		,, 20
	Jambooi	.. 25 Jany 1858		,, 30
	Srikishenpur	. 26 ,, ,,	..	,, 25
	Rajarampur	26 ,, ,,	.	,, 25
	Jot-Srirampur	.. 27 ,, ,,		,, 25
	Dinehat	1 March ,,	.	,, 20
	Kashipur	. 1 ,, ,,	..	,, 21
	Sanooi	15 April ,,		,, 25
	Rasulpui	.. 26 ,, ,,	..	,, 31
	Banteei	27 ,, ,,	.	,, 20
	Belgachi	. 1 May ,,	.	,, 20
MIDNAPUR	Bhangaband	. 1 Jany ,,		,, 30
	Badanganj	.. 10 May ,,	.	,, 31
	Shantipur	.. 15 ,, ,,		,, 20
NADIA	Nadia	.. 1 ,, ,,	..	,, 28
				Rs 845

On 13th April 1858 the Lieutenant-Governor reported to the Supreme Government that he had received some 26 applications from the Director of Public Instruction for grants-in-aid to female schools which it was proposed to establish in the different districts of East and South Bengal, but that he could not sanction them unless the rules for grants-in-aid were to some extent relaxed He pointed out that the Home authorities, in their despatch of 1st October 1856, had held out hopes that school-fees would not be required in the case of female schools, but he thought that some further encouragement was required. He accordingly proposed that the grant-in-aid rules should be so far modified in favour of female schools, that whenever a suitable school-building was provided, and the attendance of not less than 20 girls was promised, all other expenses for maintaining the school be defrayed by Government [1]

[1] *Education Con* 24 June 1858, No 167 N.

The Supreme Government, however, replied, on 7th May 1858, refusing to allow the abrogation of the grant-in-aid rules, in favour of female schools, and holding that unless female schools were really and materially supported by voluntary aid, they had better not be established at all.[1]

These orders of the Supreme Government greatly affected Vidyasagar's activities, because, he had, in anticipation of Government's sanction, established quite a number of female schools on the understanding that the inhabitants would provide suitable school-buildings while their maintenance charges would be defrayed by Government, and it now appeared to him that all his labours had been fruitless and the schools set up by him would have to be closed immediately. Another problem was the payment of the salary to their staff They had not received their pay from the commencement, and the amount due up to 30th June 1858 was Rs 3,439-3-3 The following letter, which the Pandit addressed to the Director of Public Instruction on 24th June explains the situation —

> "With reference to the orders of the Government of India bearing date the 7th ultimo forwarded with your circular letter No 1316 dated 29th idem, I have the honour to state that in anticipation of the sanction of Government, female schools were opened by me in several villages in the districts of Hughli, Bardwan, Nadia and Midnapur and the requisite establishment entertained in them The schools were opened on the condition that the inhabitants of each village would provide a suitable school house the expenses for their maintenance being defrayed by Government The Supreme Government, however, have in their orders quoted refused to grant any aid to the schools on the above condition and the institutions must therefore be closed But it is necessary that the establishment should receive their pay which they have not had since the commencement and which, I trust, Government will be pleased to pass
>
> 2 It is true that the establishment was entertained by me without orders But I must be permitted to mention that at the commencement of my operations I was not discouraged either by yourself or Government If I had been, I would never have ventured to open so many schools nor been placed in my present difficult position The establishment, having been appointed by me, naturally look up to me for payment, and it will certainly be a great hardship if I am made responsible for it, especially when the expenditure has been incurred on furtherance of an object of public utility '[2]

The Director recommended the Pandit's case to the Bengal Government in the following terms —

> ' I would venture to recommend to the generous consideration of Government the Pandit's petition to be shielded from personal and pecuniary liability on account of the female schools which,

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[1] *Education Con* 24 June 1858, No 167 O

[2] Letter from Ishwarchandra Sharma, Special Inspector of Schools, South Bengal, to W Gordon Young, Director of Public Instruction, dated 24th June 1858 - *Education Con* 5th August 1858, No 15.

in anticipation of the sanction and approbation of Government, he was the means of establishing

2 I would solicit attention to the memorandum annexed to the Pandit's letter, as the Government may perhaps hardly be aware of the extent of this officer's voluntary and unostentatious labours in the cause of female education If so much can be done in the villages by one individual burdened with other and distant duties, occupying a position of no great authority, and almost without aid or countenance from his superiors, how much might not be done in the same way if the Government were to afford its sanction and support? On the other hand, what discouragement may not be inflicted on the cause if the benevolent exertions of the officer referred to are seen to lead only to his discredit and pecuniary loss "[1]

The Bengal Government in turn placed the whole matter before the Government of India, on 22nd July 1858, with the following remarks —

"The Lieutenant-Governor desires earnestly to support the recommendation of the Director of Public Instruction, and His Honour is not without hope that when the Hon'ble the President in Council is made aware of the number of promising female schools which had been actually established by the unostentatious zeal of the very intelligent and meritorious Principal of the Sanskrit College, and which will now, together with the keen and anxious hopes and anticipations to which they have given rise, be suddenly extinguished, he may perhaps be disposed spontaneously to reconsider the orders of the 7th May "[2]

The Supreme Government before passing orders on the subject, demanded a full explanation of the circumstances under which the Pandit was, or conceived himself to be, encouraged to incur so heavy an expense in establishing the schools in question in anticipation of sanction, and also desired to know who was responsible for the encouragement under which the Pandit had claimed to have acted As at least one-half of the schools had been established, some of them for several months before the Bengal Government's letter dated 13th April 1858, the Supreme Government enquired whether the circumstance was known to the Lieutenant-Governor at that time and, if so, why it was not then mentioned [3]

In reply to the inquiry of the Government of India, the Pandit wrote thus to the Director of Public Instruction on 30th September 1858 :—

"I have the honour to state that as some female schools on this footing had already been established with the sanction of the Government, I believed that the plan was generally approved I invariably reported to your office the establishment of every new school, and usually in the month succeeding that in

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[1] *Education Con* 5th August 1858, No 14

[2] *Ibid*, No 17.

[3] *Education Con* 16th September 1858, No 1

which it was opened My several applications for the establishments required in these schools were always entertained by you though no orders were ever passed, and during a period of several months I was not in any way discouraged in the course I was taking, which I believed to be in accordance with the wishes of the Government."[1]

The Director forwarded the Pandit's letter to the Bengal Government, supporting his own case with the following observations

"For my part, knowing or believing that the Pandit had been in personal communication with the Lieutenant-Governor on the subject during my own absence from Calcutta, and inferring from your letter (No 503) of the 21st October that the Government was prepared to regard his exertions with favour, I did not hesitate to send on his reports to Government (as Mr. Woodrow in my absence had done) without delay, discouragement, or remark

"I regret to say that the untoward result with which the action of the department in this matter had been attended has given a 'heavy blow and great discouragement' to the cause of female education, from the effects of which, I fear, nothing that is likely to be now done will enable it speedily to recover "[2]

However, the Lieutenant-Governor settled the question more equitably, as his reply to the Government of India (27th Nov 1858) will show ·

3 The Lieutenant-Governor desires to submit the explanation of the Pandit for indulgent consideration, as it appears he has been acting under a misconception It appears that previous to the application made to the Government of India in my letter of the 13th April last for sanction to grant to 26 female schools recommended by the Pandit and the Director of Public Instruction, which application was not complied with four grants on similar terms had been sanctioned by the Lieutenant Governor on the 21st October 1857 under a mistaken view of his authority This was afterwards overlooked by the Lieutenant Governor and the irregularly sanctioned grants to these schools continuing uninterrupted, seemed, not unreasonably, to have led the Pandit to suppose that all other such schools would receive grants on similar terms This must have fully excused him for continuing to recommend grants to schools of a similar kind, but the question still remains why did the Pandit set the schools going and incur expense for their establishments before he had received sanction for them from Government This question the Pandit has not answered, but he might have submitted a not unreasonable excuse for his irregularity had he stated that the wording of his application always expressed that the schools about which he wrote had been established, and specified the dates on which they had each been opened And the Director of Public Instruction understood this as requiring retrospective sanction and so entered it in his prescribed tabular statement But this was

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[1] *Education Con* 2nd Decr 1858, No 4

[2] Letter from W Gordon Young, Director of Public Instruction, to the Junior Secy to the Government of Bengal dated 4th October 1858.—*Education Con* 2 Dec 1858, No 3.

undoubtedly overlooked when my letter was written dated 13th April last. There has been evidently a general misconception about these grants. For some time the Lieut.-Governor was under the impression that he could sanction them himself and when he became better informed he found that it was little more than a form to send them up the Supreme Government for sanction, believing that the Supreme Government was certain to approve and sanction them and to applaud all extension of such female schools, especially when established at the desire of the people themselves and partly at their expense. This useful view naturally commended itself to the Lieutenant-Governor's subordinates so that the Pandit thought he could not please the Government better than by encouraging female schools, and the Director of Public Instruction supposed he had only to sanction a recommendation to aid a promising girls' school and it was sure to be sanctioned The Lieutenant-Governor states all this merely as a fact without attempting to defend or extenuate the error into which he himself, not less than his subordinates, is shown to have fallen But he trusts it may be viewed indulgently, all the circumstances having been considered "[1]

The biographers of Vidyasagar are responsible for the story which has obtained currency that the Government did not do justice to the Pandit and refused to relieve him of the pecuniary liability which he had incurred by doing Government's work and which he had ultimately to meet out of his own pocket! The Supreme Government's letter dated 22nd December 1858, conveying its final orders on the subject of the female schools established by Vidyasagar, conclusively proves that the Pandit was paid all his expenses —

"It is to be regretted that the Pandit's scheme of opening female schools on a plan opposed to the orders of the Hon'ble Court, but in the name of the Government and in anticipation of sanction, *should not* have been discouraged at *once* As it is evident, however, that the Pandit acted in good faith, and with the encouragement and approbation of his superiors, His Honour in Council is pleased under all circumstances, to relieve him from responsibility for the sum of Rs 3,439-3 3 actually expended on these schools, and to direct that it be paid by the Government

"With regard to the future the President in Council observes that, so far as can be gathered from these papers, there is no security for the permanent character of any of the schools, and that the only sound material guarantee for their success, namely the voluntary support of the neighbourhood, is wholly wanting It is not even stated that school houses have been built Not an argument is brought forward to shake the decision of the Government of India already taken, that the main principle of the grant-in-aid rules shall not be relaxed in favour of these female schools If keen and anxious hopes really exist, a small monthly payment is no very violent test of them.

"With reference to the above considerations and to paragraph 38 of the Hon'ble Court's despatch, dated the 22nd June last,

[1] *Education Con* 2nd December 1858, No 6.

the President in Council must decline to give his sanction to the grant of any public money for the continued support of the female schools opened by Pandit Ishwarchandra, or for the establishment of the Government schools it is proposed to set up in their stead. The correspondence will be forwarded for the consideration of the Rt Hon'ble the Secretary of State, with a recommendation that a grant not exceeding Rs 1,000 per mensem may be made for the establishment of female schools in Hughli, Bardwan, and the 24-Parganas, a portion to be expended in assisting such schools as were established by Pandit Ishwarchandra Sharma, and a portion on a few model schools to be supported by the Government ' [1]

On a reference from the Government of India (10 January 1859) the Secretary of State for India replied (12 May 1859) that owing to the financial pressure caused by the Mutiny Government was not then in a position to entertain the proposal of making a permanent grant in aid of female schools, but reserved its consideration for a future occasion [2]

Vidyasagar had retired from Government service in November 1858 and it is said, that his resignation was due in part to his differences with the Director of Public Instruction on the question of the establishment of female schools But even the loss of a monthly income of Rs 500 and the refusal of all financial support by the Government did not make Vidyasagar despair of the future of the institutions he had established In order to set the girls' schools going, he opened a Female School Fund to which many distinguished Indians (notably Rajah Pratap Chandra Singh of Paikpara) and high Government officials contributed It will be seen from the following letter which the Pandit wrote to the Hon'ble Sir Bartle Frere on 11th October, 1863 that his efforts generally in the cause of female education were appreciated by his countrymen —

"You will no doubt be glad to hear that the Mofussil Female Schools to the support of which you so kindly contributed, are progressing satisfactorily Female education has begun to be gradually appreciated by the people of districts contiguous to Calcutta, and schools are being opened from time to time."[3]

Lieutenant Governor Beadon also encouraged the Pandit by subscribing to the Fund —

"I have now the pleasure to enclose a cheque for Rs 330 on account of Sir Cecil Beadon s subscription to the Female Schools for the half year of 1866 This would have been sent before

[1] Letter from C Beadon, Secretary to the Govt. of India to C. T. Buckland, Junior Secy to the Govt of Bengal dated 22nd December 1858 - *Education Con* 20 Jany 1859, No. 9

For the minutes of the members of the Supreme Council, indemnifying the Pandit, see *Education Branch Con* 24 Dec 1858, No 5 (Imperial Records)

[2] *Education Con* 14 July 1859, No 27

[3] Mitra's, *Iswar Chandra Vidyasagar*, p. 173

but the cheque book was accidentally left behind." (17 August 1866)[1]

VIDYASAGAR'S SERVICES TO THE BETHUNE SCHOOL.

Vidyasagar was made Honorary Secretary of the Bethune School Committee in August 1856, and a member[2] of the Committee in January 1864 In spite of the numerous demands on his time and attention, he always took a lively interest in the welfare of that institution We get a glimpse of the condition of the school and the progress made by it during his Secretaryship in the following report (dated 15 Dec 1862) —

"Reading, writing, arithmetic, biography, geography, and history of Bengal, with gallery lessons on objects form the course of study Needle work and sewing are likewise taught Instruction is imparted to the pupils through the medium of the vernacular The tutorial staff consists of a Head Mistress, with two female assistants and two pandits Besides general superintendence the Head Mistress teaches needle-work to the first and second classes, and revises the lessons given to them by the pandits The second mistress teaches needle-work and sewing to the remaining classes, assisted by the third mistress The third mistress teaches in addition the class consisting of beginners in which the phonetic system is being experimentally introduced The pandits teach all the books read in the several classes .

"As regards the number of admissions, the Committee beg to observe that there has been a steady increase from 1859 The number at present on the rolls is ninety-three It would have exceeded 100 ere this, if the Committee had not been obliged to reject applications for admission for some time from want of the means of conveyance. The inconvenience has since been removed by the provision of a third carriage, and it is hoped that the anticipated increase will soon take place It may be as well to mention, with reference to this third conveyance, that, Rajah Pratap Chandra Singh Bahadur presented an omnibus, and that some of the members of the Committee, and a few other native friends of female education, subscribed for a pair of horses .

"As regards the proficiency attained by the first class, the Committee regret to observe that, owing to early withdrawals, the majority of the pupils are unable to prosecute their studies up to the desired standard In cases, however, where girls are admitted at an early age, and permitted to remain at school till the age of eleven or twelve, they attain a fair amount of knowledge in the different subjects taught.

"From the manner in which the number of admissions has recently gone on increasing, the Committee trust that the institution is rising in the estimation of those classes of the community for whose benefit it was originally established The wealthier classes of native gentlemen do not indeed seem as yet to be

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[1] Mitra's, *Isvar Chandra Vidyasagar*, p. 173

[2] S C Bayley, Junior Secy to the Govt of Bengal, to Pandit Ishwarchandra Sharma, dated 19th Jany 1864 —*Ed Con.* Jany. 1864, No. B. 160

availing themselves directly of the advantages offered by the school; a very few admissions have as yet been made from those classes The Committee, however, are happy to believe that home education for females is being resorted to in many families amongst the wealthier classes, and this result, they believe, is in a considerable degree owing to the beneficial influence of the Bethune School

"If a large number of conveyances were at the disposal of the Committee, the school might be made more extensively useful It will be understood, however, that if the number of children should exceed a certain limit, increased resources will then be required in order to supply an extra staff of instructors, etc ... "[1]

Miss Mary Carpenter's name is well known in this country as a philanthropic worker and friend of the Indian people She paid a visit to Calcutta during the latter part of 1866 She wished very much to promote female education in India, and on her arrival in Calcutta sought to make the acquaintance of Vidyasagar who was well known as a champion of the cause of female education Mr Atkinson, the Director of Public Instruction, wrote a letter to the Pandit on 27th November 1866 making an appointment with him to meet Miss Carpenter at the Bethune School

She visited some of the female schools in the vicinity of Calcutta accompanied most of the time by Vidyasagar, with whom she had contracted a sincere friendship at her first meeting In December 1866 she visited the Uttarpara Girls' School along with Vidyasagar, the D P I., and Mr. Woodrow—an Inspector of Schools On the return journey the Pandit met with a serious accident—his buggy (dog-cart) capsizing and causing severe injuries to his liver. In consequence of this accident his health was greatly impaired, and it paved the way for the fatal malady which brought about his death in July 1891 But Vidyasagar paid no heed to the decay of his health and like a true patriot, continued to work hard for the good of his country

Miss Carpenter moved the Government to undertake the establishment of a Normal School for the training of native female teachers to be accommodated temporarily in the premises of the Bethune School On 1st September 1867 Sir William Grey, the Lieutenant-Governor of Bengal, asked for Vidyasagar's views on the proposal The Pandit, however, was opposed to the measure and he gave the following reply :—

"Since we met last, I have made careful enquiries and have thought over the subject, but I regret to say that, I see no reason to alter my opinion as regards the difficulty of practically carrying out Miss Carpenter's scheme of rearing a body

[1] From Pandit Ishwarchandra Sharma, Hony. Secretary, Bethune School Committee, to the Hon ble A Eden, Offg. Secy. to the Govt of Bengal, dated the 15th Decr 1862 —*Education Con* Decr. 1862, Nos. A. 59-62.

of native female teachers either in connection with the Bethune School or independently, such as may be acceptable to the bulk of the Hindu community and worthy of their confidence Indeed, the more I think about it the more am I convinced that I cannot conscientiously advise the Government to take the direct responsibility of setting in motion a project which, in the present state of the native society and native feeling, I feel satisfied, will be attended with failure. You can easily conceive whether respectable Hindus will allow their grown up female relatives to follow the profession of tuition and necessarily break through the present seclusion, when they do not permit the young girls of ten or eleven years to quit the zenana after they are married The only persons, whose services may be available, are unprotected and helpless widows, and apart from the consideration whether morally they will be fit agents for educational purposes, I have no hesitation in saying that the very fact of their dispensing with the zenana seclusion and offering themselves as public teachers will lay them open to suspicion and distrust and thus neutralize the beneficial action aimed at

"I think the Government cannot pursue a better course on this subject than what has been indicated in the India Government's letter lately published in the papers The best test of popular feeling will be the application of the grant in aid principle If the people are willing to carry out Miss Carpenter's idea, they should be assisted with liberal grants by Government Although the great bulk of the Hindu community, so far as I can perceive, will not avail themselves of such assistance, still there are particular individuals who seem to be very sanguine on this subject and if they are sincere and earnest they will, at any rate, it may be hoped, come forward and with Government aid, begin the experiment.

"I am free to confess that I do not place much reliance in them, but they will have no right to complain under the rules announced by the Government of India.

"I need hardly assure you that I fully appreciate the importance and desirableness of having female teachers for female learners, but if the social prejudice of my countrymen did not offer an insuperable bar, I would have been the first to second the proposition and lend my hearty co-operation towards its furtherance But when I see that success is by no means certain and that the Government is likely to place itself in a false and disagreeable position, I cannot persuade myself to support the experiment

"As regards the Bethune School, I entirely go with you that the results are not proportionate to the amount expended upon it, but at the same time I cannot recommend its abolition altogether As a memento of the services to the cause of female enlightenment in India of the great philanthropist whose name the Institution bears, it has, I submit, a claim to the support of Government In the next place, it is very desirable that there should be a well-organized female school in the heart of the metropolis, to serve as a model to sister institutions in the interior The moral influence of the present institution in native society has been undoubtedly great It has, in fact, paved the way to female education in surrounding districts and this, in my humble opinion, is no mean return for the large sums which have been annually expended upon it. But I must say that there is great room for economy and improvement. The expenses, I think, can be reduced to nearly half the present amount without detriment to the efficiency of the institution.

> "I intend to go to the North-Western Provinces shortly for prolonged change for the benefit of my health and if you wish to know my views on the re organization of the Bethune School, I shall be happy to await your return to Calcutta and confer with you on the subject" (1st Oct 1867)

The Lieutenant-Governor acknowledged receipt of the Pandit's letter on 14th October, 1867 in the following terms :—

> "I am greatly obliged to you for your letter of the 1st instant ; it is both useful and interesting I hope you will not, on any account, postpone your visit to the N -W Provinces, and I trust that you will obtain a revival of health from the change
>
> "Should I find you in Calcutta however a few days hence, I shall be most happy to see you and to hear your views as to the re organization of the Bethune School Otherwise you can perhaps find leisure to write to me on the subject from the N West
>
> "If you should desire to have letters of introduction to any of the Government officers in the N -W Provinces, I shall be glad to assist you in that way I shall be at Belvedere from the 18th inclusive"

The Government of Bengal, however, favoured Miss Carpenter's scheme, and an opportunity for giving it a trial soon arose

Some time about the middle of 1867 the Bethune School Committee were led to believe, from the falling off in the number of pupils, as well as from other circumstances, that the condition of the school required a searching enquiry and, accordingly, at a special meeting held for the purpose in July 1867, a Sub-Committee, consisting of Ishwarchandra Vidyasagar, Kumar Harendra Krishna Deb and Prasanna Kumar Sarvadhikari, was appointed. The Sub-Committee met, enquired fully into the subjects, and submitted their report on 24th September, 1867 This report disclosed the fact that gallery teaching had been neglected, the children were not well taught, the promotions were not properly made, and that the distribution of the teaching agency had not been very judicious The Bethune School Committee maintained that the school would not flourish or recover its position as long as Miss Pigott was at its head [1]

In its letter dated 3rd March, 1868 the Bengal Government, while concurring with the desirability of an early termination of the service of the Head Mistress, wrote to the Committee of the school as follows —

> "I am to request at the same time that the Committee will be so good as not to proceed to the engagement of another Mistress without communicating with the Lieutenant-Governor His Honour is disposed to think that the opportunity should be taken to render the building bequeathed by the late Mr Bethune and the large annual grant from the general revenues which is now connected with it more useful in the promotion of female education

[1] *Education Con* March 1868, No A. 8.

than he believes it to be under present arrangements, and this end, the Lieutenant-Governor is led to believe may be materially served by combining with a Female School on a more moderate scale than the present one, a Normal School for female teachers

"If it is determined to utilize the Bethune School building, and the funds connected with that building for such a purpose, it will be desirable to bring the whole institution into more close and direct connection with the Education Department than it is at present The Lieutenant Governor will be glad to know if in this event the Committee of native gentlemen who have hitherto, with an English President, conducted the affairs of the Bethune School, would be willing to act as a Consultative Committee in co-operation with the Divisional Inspector of Schools "[1]

The Committee refused to take part in the management of the institution in future if they were placed on the footing suggested, and their Hony Secretary, Pandit Ishwarchandra Vidyasagar gave the following reply to the Bengal Government on 13th June, 1868 —

"As regards the establishment of a Female Normal School, the Committee, in their letter to the Director of Public Instruction,[2] have stated at length their views, and they desire me to forward a copy of the same for His Honour s information

"The members of the Committee, I am desired to state, regret much their inability to act in the proposed Consultative Committee under the Divisional Inspector of Schools for the management of the Normal School "[3]

The Lieutenant-Governor, before passing final orders in this important matter, desired the D.P I for a full expression of his opinion after consulting Mr Woodrow, the Inspector of Schools, Central Division [4]

The D P I held that both economy and efficiency would be best ensured by combining the Normal School and the Bethune School in one institution under a single Superintendent, subject to the direct control of the Education Department [5]

The Lieutenant-Governor approved the scheme proposed by the Director.[6] One Mrs Brietzche was, on 27th January 1869,

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[1] *Education Con* March 1868, No A 9.

[2] This is a lengthy letter which W S Seton-Karr (the President of the Bethune School Committee) addressed to the D.P.I on 18th Feby , 1867, negativing the proposals of Mary Carpenter for the establishment of a Female Normal School in Calcutta, contained in the D P I.'s letter to the Bethune School Committee, dated 16 Feby , 1867 —See *Ed Con.* July 1868, No A 69

[3] *Education Con* July 1868, Nos. A 68-70, *Supplement to the Calcutta Gazette*, dated 3rd Feby , 1869

[4] Bengal Govt to D.P I dated 20 July, 1868.—*Ed Con* July 1868, Nos A 68-70.

[5] D P I to Bengal Govt. dated 28 Dec , 1868 —*Ed. Con.* March 1871, Nos B 43-56

[6] Bengal Govt to the D P.I., dated 25th January, 1869.—*Ed Con.* March 1871, Nos B 43-56

appointed Lady Superintendent of the Bethune and Normal Schools for three years on a salary of Rs 300 per month. The Bethune School Committee was dissolved, and the D.P.I. conveyed thanks to the members of the Committee—specially to Vidyasagar, their able Secretary—for their past services

Vidyasagar, although not very hopeful of the success of the new arrangement, gave the authorities every possible assistance whenever asked, as will be seen from Mr Woodrow's letter to the D P.I, dated 2nd March, 1869 :—

> "I have the honour to report that Pandit Ishwarchandra Vidyasagar made over to me the documents relating to the Bethune School on the 23rd instant [February]. He also spent a long time in going with me over the school and its grounds and discussing the means necessary to make it suitable for the residence of Hindu ladies
>
> "He kindly offered to give me every assistance in his power in the establishment of the Normal School though he entertains but slight hopes of its success while placed in Calcutta "[1]

But the Pandit proved a true prophet and, before some three years were over, Sir George Campbell, the next Lieutenant-Governor, ordered the Female Normal School—attached to the Bethune School—to be closed after 31st January, 1872, as he was satisfied that if an undertaking of this nature was to succeed in the existing state of Indian society it must be started and managed by the people of the country according to their feelings and fashions[2] The order for the immediate abolition of the Normal School was conveyed to the D.P I in the following letter —

> "On a general review of the whole subject, it is clear that after a three years experiment the Female Normal School has unquestionably failed ... The Lieutenant-Governor is himself too inclined to think that there is much in the view taken by the ladies most experienced in these matters, *viz*, that it may be very dangerous to give women education and a certain freedom of action without the sanction of *some* religion ....
>
> "The Female Normal School will, therefore, be closed after the 31st January, 1872."[3]

It will be seen from the foregoing what ardent interest Pandit Ishwarchandra continued to take throughout his life in the cause of female education in Bengal. After his demise

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[1] H Woodrow, Inspector of Schools, Central Dvn. to the D.P I., dated 2 March, 1869, *Ibid*

[2] "A rival school [was] opened by Babu Keshav Chandra Sen with funds supplied by Miss Carpenter, but in direct opposition to her wishes.... Babu Keshav Chandra Sen is now about to close his school on the strong remonstrances of Miss Carpenter, who has refused to allow the funds supplied by her to be spent on its support"—*D.P I. to Bengal Govt*, dated 27th Dec., 1871.—*Ed Con* Jany 1872, Nos A 30-36.

[3] The Under-Secy., Govt. of Bengal to the D.P.I, dated 24th Jany., 1872.—*Education Con.* Jany. 1872, Nos A. 30-36. See also *Ed. Con.* April 1872, Nos. A. 54-58.

in July 1891, a body of Hindu ladies perpetuated the great Pandit's memory in the following manner :—

> "The Committee beg to announce that they have recently received the sum of Rs. 1,670 from the Secretary to the Ladies' Vidyasagar Memorial Committee in Calcutta, for the establishment of an annual scholarship tenable for two years to be awarded to a Hindu girl who after passing the annual examination in the third class of the school, desires to prepare herself for the University Entrance Examination The late Pandit Ishwarchandra Vidyasagar was the co-adjutor and fellow-worker of Mr Bethune, when the school was founded, and since then continued, so long as he lived, to take the keenest interest in its welfare. It is, therefore, a source of great gratification to the Committee to find that a body of Hindu ladies in Calcutta should have interested themselves in this manner to perpetuate the memory of the late Pandit Vidyasagar who, during his lifetime, in addition to the philanthropic work to which he devoted his whole life, had done so much to promote Female Education in Bengal "[1]

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[1] In the presence of H E. the Viceroy and Governor-General of India—Lord Elgin, and many other notable European and Indian gentlemen—Bethune College—5th March, 1894 Annual Report.

On the Dates of Publication of The Fishes of India by Dr. Francis Day.

BY B PRASHAD.

(Published by permission of the Director, Zoological Survey of India, Calcutta)

The Fishes of India by Dr Francis Day is a fairly complete illustrated account of the fishes of the Indian Empire including Burma and Ceylon, and, though published in the eighties of the last century, is the most standard work of reference on the subject even to-day The main work was published in four parts between 1875–1878, and a Supplement with its pages in continuation of those of the main volume was issued later in 1888 Practically no information has so far been available regarding the exact dates of publication of the various parts and the information published in the *Zoological Record* is inaccurate in several respects Many new species were described and illustrated in the *Fishes of India* for the first time, and to settle the questions of priority in connection with nomenclature of these forms it is desirable that accurate information on the dates of publication of the various parts should be available In Dean and Eastman's work on the Bibliography of Fishes [1] there is no information about the various parts either with reference to the text or the plates and the date of publication of the whole work is given as 1875–1878, while the Supplement issued in 1788 is listed separately Similarly no information is available in the Library Catalogue of the Books etc , in the British Museum, Natural History, London,[2] which is a mine of information on such questions *Fishes of India* is catalogued as a quarto publication issued in London (1875–) 88 consisting of pp xx, 778 (–816), the pages in brackets being those of the Supplement which was issued ten years after the main work In the introduction of the first volume on the *Fishes*[3] in the *Fauna of British India* Series the then Editor Dr W T. Blanford wrongly gives the dates of issue of the *Fishes of India* as 1876–78. Dr B. L

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[1] Dean, B and C R Eastman—*A Bibliography of Fishes*, Vol. I, p 304 (New York, 1916)

[2] Woodward, B B —*Cat Books, Manuscripts, etc., in the Brit Mus (Nat Hist)* Vol I, p 430 (London, 1903)

[3] Day, F.—*Fishes* in *Faun Brit Ind* Vol. I, Introduction, p iii (London, 1888)

Chaudhuri[1] in his valuable paper on the Bibliography of Indian Fishes gives the dates of the work as 1875–78 and does not mention the Supplement, which, as we noted above, was published in 1888

In most of the copies of the whole work, which I have seen, all the parts are bound together and the title pages of the several parts are not preserved A further difficulty in this connection arises from the fact that apparently two distinct issues of the work were issued; this does not seem to be indicated anywhere In the first issue the work, excluding the Supplement, was published in four separate parts, while in the second issue the idea of dividing the text and plates into two volumes appears to have been adopted In this issue the only difference about the text apparently was to print an additional title page with the words "Vol I" on it, the words "End of Vol I" about the middle of page 320 of the text and the issue of an Alphabetical Index for this volume (pp i–xii); these additional pages were evidently, as appears from the title page of this issue, printed in 1876 The second volume of this issue has on the title page "Vol. II, Atlas—Containing 198[2] plates" and contains the Preface, the Introduction and Systematic Index (pp i–xx) and the General Alphabetical Index at the end (pp 749–778) The date of issue of this volume was 1878

In a volume consisting of the first two parts of the work only belonging to the late H. Milne-Edwards of Paris and now in my possession, the title pages of the parts are fortunately preserved and the two parts are bound apparently as they were received from the publishers Of the third part also I have before me a copy of the plates only (lxxix–cxxxiii) in boards with a printed title page and the following additional information —On the left hand top corner is printed "Part III," while on the right hand top corner in two lines "In Four parts Subscription price for the whole work £12 12 s" and the date at the bottom of the page "August 1877." In another copy I found a pencil note giving the date of issue of the first part as August 1875

There is a curious inaccuracy in the information about the introduction in the *Zoological Record* for 1878 (Vol. XV, p. 5 Pisces) where the Recorder—A W. E. O'Shaughnessy—states that "The work is preceded by an introduction occupying nine pages" and does not mention the Preface. Similarly in Vol. XII, of the *Zoological Record* the same author does not include pl xl, which was issued with the first part; he also

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[1] Chaudhuri, B. L.—*Journ Asiat. Soc Bengal*, Vol. XIX, p. cxlix, (1918)

[2] This is apparently a misprint, for the number of plates issued with the work in all the copies I have seen, is 195 and not 198.

makes no mention of it in the information about the subsequent parts.

It is of interest to note that the Supplement of this work which, as noted already, was issued 10 years after the publication of the main work, is very rare, and is missing in most copies in India. Though consisting only of 38 pages with 7 text-figures, second-hand copies of it fetch as much as £1.

The results of my collation of the dates of this work are as follows :—

Part, I. pp. 1–168, pls i–xl (1875, probably August)
Part, II pp. 169–368, pls. xli–lxxviii (1876).
Part, III pp. 369–552, pls. lxxix–cxxxiii (1877)
Part, IV. pp i–xx consisting of Preface, Introduction and Systematic Index, and text pp 553–778, pls cxxxiv–cxcv (December 1878)
Supplement pp 779–816 with 7 text-figures (1888).

Precession and Libration of the Equinoxes in Hindu Astronomy.

BY SUKUMAR RANJAN DAS.

The observation of the Sun's motion with reference to the signs of the Zodiac must have very early led to the discovery of the phenomenon, namely, at succeeding equinoxes the sun does not come to the same stars, but that the signs and the stars are observed to have a motion relative to the point, which the sun occupies at either equinox and that the direction of motion is opposite to the sun's observed annual motion among the stars In 134 B C. Hipparchus in Greece discovered this fact on observing a star which was new to him, but the precession was apparently long known to Hindu astronomers, and its rate determined by them roughly to a near approximation

Now it was a very remarkable achievement for the ancient astronomers, for the discovery of precession was essential to the progress of accurate observational astronomy Hence we like to put in here a few words to explain the phenomenon following the method of synthesis as far as practicable We know that the path of the sun in the celestial vault is accurately a circle and it follows that its orbit must be a closed plane curve An observation of the stars which may be regarded as fixed to the celestial vault and in space, leads to the conclusion that this plane is fixed in space. The line perpendicular to this plane through the centre of the celestial vault is, therefore, fixed in direction in space and precession consists in the rotation of the earth's axis about this line in a period of 26,000 years The point at which the polar axis meets the celestial vault thus describes a small circle in space as a necessary consequence, the stars that occupy the region marked by this circle become pole stars in succession While this goes on, the line of intersection of equator and ecliptic (which passes through the sun at an equinox) points to different stars at different epochs.

There is no mention of precession in the Jyotisa Vedanga which was probably composed in the 12th century B C. Nor is it dealt with in the Brāhma Sphuta Siddhānta of Brahmagupta and the Śiṣyadhīvrddhida of Lalla. It is not also found in the original text of Sūrya Siddhānta, though found in the present form of Sūrya Siddhānta, as there is no mention of this phenomenon in the text of Sūrya Siddhānta included in Varāhamihira's Pañcha Siddhāntikā.[1] Of the Siddhāntas,

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[1] Vide page 326, Bhāratīya Jyotih Śāstra by S B Dikshit

now extant, the Soma, the Brahma, the Saura and the Vaśiṣṭha of the first or inspired period deal with this doctrine It has also been mentioned by Āryabhaṭa II (950 A.D), Munjāla and Bhāskara of the second period. Hence it is evident that precession was known from the time of the Saṃhitās, as Brahma Siddhānta forms a part of the Sākalya Sambitā,[1] the principal parts of which were probably written about a century later than the Jyotisa Vedānga (Vide page 62, Prof. J. C. Roy's "Our Astronomy and Astronomers")

(1) In the Soma Siddhānta we get the following rule for finding out the precession[2] .—

In one mahāyuga the circle of asterisms librates 600 times. Multiply this figure by the number of days elapsed since the beginning of creation and divide the product by the number of days in one yuga. The result will be the total distance in arc moved owing to precession by the star which was taken as the initial point of starting, since the beginning of creation The arc after deduction of the complete revolutions will give the amount of longitude of the ayanagraha[3] (the initial star) This multiplied by 200 and divided by 600 will give the amount of precession of the first point of Aries on a particular day If the ayanagraha be within the six signs beginning from Libra (Sanskrit तुला), the amount of precession will be added to and if within the six signs beginning from Aries (Sanskrit मेष), it will be subtracted from the ayanagraha for correction ; and this is required to find the position of the equinox[4]

For example, to find the precession on the 1st of Vaiśākha in 1844 Saka or 1922 A D

Find the number of days which have elapsed since the creation.

Number of years elapsed since creation to the beginning of Kaliyuga is 1969920000

Number of years from the beginning of Kaliyuga to the beginning of Saka era is 3179.

Hence the number of days elapsed since creation up to the 1st Vaiśākha 1844 Saka is (1969920000 + 3179 + 1844) × number of days in one year

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[1] Some are of opinion that portions of the Sākalya Samhitā are written at a later date But I believe that the portions in which the precession appears are of a considerable early date For, we know that Brahmagupta refers to Viṣnuchandra's theory of precession and refutes it It is believed that Viṣnuchandra got the clue from earlier writers However, this is a disputed point

[2] Soma Siddhānta, Spastādhikāra, verses 31 and 32.

[3] A planet's longitude as corrected for ecliptic deviation Monier William's Dictionary

[4] Vide an article on "Precession" by Dr. Ekendra Nath Ghosh published in Bangīya Sahitya Pariṣat Patrikā

Total distance in arc travelled by the ayanagraha is $\frac{600 \times 1969925023 \times \text{No. of days in one year}}{4320000 \times \text{No of days in one year}} = 273600\frac{5023}{7200}$ *i.e*

273600 complete revolutions $+ \frac{5023}{7200}$ of a revolution $= 273600$ complete revolutions $+ 251° 9'$

Hence deducting the complete revolutions, the length of arc is 251° 9′.

Therefore, the longitude of the ayanagraha is $251° 9' - 180° = 71° 9'$. Therefore precession $= \frac{71° 9' \times 200}{600} = 23° 43'$.

According to the Soma Siddhānta the first point of Aries moves 30° on both sides of the Nirayana bindu, the fixed initial point, so that in the time when the ayanagraha makes one complete revolution, *i e*, moves through 360°, the first point of Aries (Krāntipāta bindu) moves through $30 \times 4 = 120°$

Hence to find the precession we multiply the longitude of

$$\text{the ayanagraha by } \frac{120}{360} \text{ or } \frac{1}{3} \text{ or } \frac{200}{600}.$$

(2) Next we come to the Brahma Siddhānta This work is different from Brāhma Sphuta Siddhānta The problem of precession was treated at a considerable length in this work In discussing the theory of libration, it says that the circle of asterisms librates 600 times in one Mahāyuga [1] and lays down a rule to find out the precession which is the distance between the position of the first point of Aries at any time and the initial point of starting. The process is a bit different from that of the Soma Siddhānta. We find the total distance in arc moved by the ayanagraha and thence its longitude, then multiply this by $\frac{3}{10}$ instead of $\frac{200}{600}$ or $\frac{1}{3}$ For example, if you want to find the precession on the 1st of Vaiśākha, 1844 Saka, by this method, we get as before the longitude of the ayanagraha to be 71° 9′. The precession is $\frac{3}{10}$ of $71° 9' = 21° 20' 42''$

(3) Next we come to the Sūrya Siddhānta [2] It says, that the circle of asterisms librates 600 times in a great yuga, that is to say, all the asterisms, at first, move westward 27°, then returning from that limit they reach their former places, then from those places they move eastward the same number of degrees, and returning thence come again to their own

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[1] Brahma Siddhānta of the Sākalya Samhitā, Chap. II, verses 184–194.

[2] Sūrya Siddhānta, chap. III, verses 9,10.

Pandit Bāpudev Sastri says that this portion of Sūrya Siddhānta is of later origin, as it does not occur in the original text included in the Pañcha Siddhāntikā of Varāhamihira.

places, thus they complete one libration or revolution, as it is called In this way the number of revolutions in a Yuga is 600 which answers to 600,000 in a Kalpa

Multiplying the Ahargana (or the number of elapsed days) by the said revolutions and dividing by the number of terrestrial days in a Kalpa, we get the quotient as the elapsed revolutions, signs, degrees, etc

Rejecting the revolutions, find the *bhuja* of the rest (i e, signs, degrees, etc, as mentioned in verse 30 of the second chapter). The *bhuja*, just found multiplied by 3 and divided by 10, gives the degrees, etc, called the Ayana

For example, we find the precession on the 1st of Vaiśākha, 1844 Saka, thus —

The number of elapsed days is 1969925023 × No of days in one year

The distance in arc travelled by the Ayanagraha

$$=\frac{1969925023\times 365\times 600}{4320000\times 365}=273600 \text{ complete revolutions} +$$

251°9′

Hence, the longitude is 251°9′ − 180° = 71° 9′.

The precession is $\frac{3}{10}$ of 71° 9′ = 21° 20′ 42″

(4) In the Vasistha Siddhānta the method of finding out the precession is this[1]:—Multiply by 27 the remainder of the division of the number of years elapsed since creation by 1800 and divide the product by 1800 When the amount of precession is greater than 27°, the position of the equinox is found by subtracting the amount from 54°, if greater than 54° then subtract from 81° In one yuga or 4320000 years the circle of asterisms librates 600 times Therefore, in $\frac{4320000}{600}$ or 7200 years the circle librates once In this time the first point of Aries moves 27 × 4 or 108° eastward and westward. It moves 27° in $\frac{7200}{4}$ or 1800 years For example, to find the precession on the 1st of Vaiśākha, 1844 Saka, we get as before the number of years elapsed since creation = 1969925023.

The remainder of 1969925023 − 1800 is 1423.

$$\text{Therefore, precession} = \frac{1423\times 27}{1800} \text{ or } 21°\ 20'\ 42''.$$

(5) In the Vrddha Vaśistha Siddhānta, the process is only referred to in passing[2] Divide the number of years elapsed since creation by 7200, and then find out the longitude in degrees, etc Multiply the longitude by $\frac{3}{10}$. For example, to

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[1] Vaśistha Siddhānta, Madhyamādhikāra, verses 36-38, also Spasta Adhikāra, verse 55

[2] Vrddha Vaśistha Siddhānta, chap II, verse 35.

find out the precession on the 1st of Vaiśākha, 1844 Saka, we get $\frac{1969925023}{7200}$ (is the same as $\frac{1969925023 \times 600}{4320000}$ of the Sūrya Siddhānta or Brahma Siddhānta) = 273600 revolutions + 251° 9′

The longitude is 251° 9′ − 180° = 71° 9′

Hence, the precession is $\frac{3}{10}$ of 71° 9′ = 21° 20 42″.

The principle followed by Brahma Siddhānta is the same as that followed by Saura Siddhānta, Vaśistha Siddhanta and Vrddha Vaśistha Siddhānta. They say that the first point of Aries moves 27° × 4 or 108° when the Ayanagraha makes one complete revolution, i e, the first point of Aries moves 27° when the Ayanagraha moves 90°. Hence the multiplier is $\frac{27}{90}$ or $\frac{3}{10}$

(6) Next we come to Munjāla Munjāla in his Laghu Mānasa (854 Saka or 932 A D) says that there are 199669 revolutions in a Kalpa. At the time of Munjala the precession was one minute and the Saka year of 449 was of zero precession. He states that the annual precession = 59 9007 seconds of arc [1]

(7) Next we come to the Mahasiddhānta of Aryabhata II (875 Saka) There we find the mention of different kinds of motion Mention is first made of the revolution of the Saptarsi asterism (Saptarsīnām Kunidhudhidhudhijā) in the 11th verse of Madhyamādhikāra, i e, the Saptarsi asterism makes 1599998 revolutions Next is mentioned the revolution of the Ayanagraha which is 578159 times in one yuga (masihatamudhāh ayanagrahasya) Then is found the precession in the 13th verse of the Spastādhikāra Find the longitude of the Ayanagraha from the revolution of the Ayanagraha, hence find the declination The arc thus found gives the precession. In the opinion of Āryabhata II the precessional motion is 24° × 4 = 96° when the ayanagraha makes a complete revolution or moves 360° Hence, the annual precession is thus found The Ayanagraha moves in one year

$$\frac{578159 \times 1296000''}{4320000000} \text{ (where } 360° = 1296000'') = 173{\cdot}4477''.$$

[Here 4320000000 is the number of years is one yuga]

$$\text{Hence the annual precession} = \frac{173\ 4477'' \times 96}{360} = 46\ 2527''.$$

The procedure laid down in the Mahāsiddhānta is entirely different from that in the other Siddhāntas. It is mainly that Āryabhata II deduces the precession from the declination of the solstitial point whose movement about the initial point he takes

[1] Vide Bhāratīya Jyotih śāstra by S. B. Dikshit, page 313 and page 330.

into account instead of the movement of the first point of Aries, and that the movement is 24° eastward and 24° westward. This, of course, brings the amount nearer to that found in modern astronomy which is 24° 30'.[1]

(8) Lastly, let us come to the discussion on precession in the Siddhānta Śiromani of Bhāskara where he lays down the following.—

The point of intersection of the equinoctial and ecliptic circles is the Krāntipāta or intersecting point for declination. The retrograde revolutions of that point in a Kalpa amount to 30,000 according to the author of Sūrya Siddhānta. The motion of the solstitial points spoken of by Munjāla and others is the same as this motion of the equinox, according to these authors its revolutions are 199669 in a Kalpa [2]

The precession found by Munjāla and Bhāskara is different from that found in Sūrya Siddhānta and other works. Bhāskara has done very little justice to this matter Burgess and Whitney have rightly remarked, "Now it is not a little difficult to suppose that a phenomenon of so much consequence as this, which enters as an element into so many astronomical processes should have been hidden away thus in a pair of verses"

It is curious why Bhāskara has made the mistake of putting 30,000 for half of a revolution, or for the retrograde motion of the libration instead of 300,000 There must, therefore, have been some mistakes in the transcript.

Bhāskara supposes the equinoctial point to be in motion, whereas the Sūrya Siddhānta assumes that the entire circle of asterisms oscillates, first 27° on one side of a mean point and then 27° on the other side of that point This supposed motion of the whole of the constellations might have led Bentley to assume that the ancient Hindu astronomers had two systems of Lunar asterisms, the one fixed and the other moveable, the latter of which he called the Tropical Sphere, which was at one time in coincidence with the Sidereal Sphere, and from this it has been separating at a rate equal to the annual precession.[3]

Now we shall refer to the discussion on the two theories—one of complete revolution through the whole of the asterisms and the other of oscillation of the equinoxes.[4] Munjāla, the author of Vaśistha Siddhānta, Prithūdaka and several others maintain that there is a complete revolution through the whole of the asterisms, while Sūrya Siddhānta and the other four Siddhāntas state that there is oscillation of the equinoxes

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[1] Vide a paper on "Precession" by Dr. Ekendra Nath Ghosh, M.D., in the Bangīya Sāhitya Parisat Patrikā

[2] Siddhānta Śiromani, chap VI, verses 17 and 18

[3] Brennand's Hindu Astronomy, page 78

[4] Bhāratīya Jyotih Śāstra, page 332.

eastward and westward Thus Revatī is supposed to librate 27 degrees to the east and then 27 degrees to the west according to the Sūrya Siddhānta but 24 degrees to the east and 24 degrees to the west according to the Mahāsiddhānta of Āryabhata II. We have already said that in 445 Saka or 523 A.D. the amount of precession was supposed to be zero and the annual precession was about 60". According to the Āryasiddhānta of Āryabhata II, the amount of precession would be 24° in Saka 1885 or 1963 A.D , and according to the Sūrya Siddhānta the amount of precession would be 27° in Saka 2221 or 2299 A.D. Here it may be noted that the theory at present recognised by modern European astronomers is both of oscillation and continuous motion either forward or backward; whereas the generally recognised theory of the Hindu astronomers is of oscillation only.

The Hindu astronomical works state that the first point of Aries (Meṣa krānti bindu) moves along the Ecliptic (krānti vṛtta) twenty-seven degrees on each side of the Nirayana bindu, the fixed initial point; that is to say, in a certain number of years it goes twenty-seven degrees away from the Nirayana bindu, then returns to it, again goes twenty seven degrees the other side and comes back to the Nirayana bindu in a certain number of years [1] This was the doctrine of a libration of the Equinoctial and Solstitial points. Colebrooke, in his essay on the equinoxes, has given the views of a number of writers on the subject, by some the motion is considered to be an entire revolution, through the whole of the asterisms, by others and those the most numerous, it was a libration between certain limits on each side of a fixed point; by a few amongst whom was the celebrated astronomer, Brahmagupta, who (though he was aware of the fact that the southern solstice had been formerly in the middle of Aśleṣā, and the northern in the beginning of Dhanisthā) had doubts regarding the motion He remarks upon the passage in the text, relating to their former position, "this only proves a shifting of the solstices, nor numerous revolutions of them through the Ecliptic " Brahmagupta attributes the cause of the seasons to the Sun's motion only and not to the precessional motion of the equinoxes [2] He quotes the view of Visnuchandra supporting the precessional motion and refutes it. But Prithūdakasvāmi, Brahmagupta's commentator, supports Visnuchandra's view and refutes Brahmagupta [3]

This theory of libration has been refuted by modern European astronomers. But Tilak says in his Orion, [4] "This

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[1] Brennand, Hindu Astronomy, page 77
[2] Brāhma Sphuta Siddhānta, chapter II, verse 54.
[3] Vide page 329, Bhāratīya Jyotiṣh Śāstra by S. B. Dikshit
[4] Orion, page 82.

hypothesis is now given up by modern astronomers as mathematically incorrect, but no reason has yet been assigned why it found place in the Hindu astronomy A theory may be erroneous but even an erroneous theory cannot become prevalent without a good cause It has been suggested by Bentley and approved by Whitney that the limits of the libration might have been determined by the fact that the earliest recorded Hindu year had been made to begin when the Sun entered the asterism of Kittika or 26°40′ in front of Revatī. But this alone is not sufficient to suggest the theory of libration For, unless the Hindu astronomer had grounds—conclusive and otherwise inexplicable—for holding that the vernal equinox fell 27° on each side of Revatī, he would not have proposed the libration of the equinoxes So far as I know no such ground has yet been discovered by modern scholars "

The theory of a libration had been prevalent in India from very early times and it was a doctrine maintained by most of the Hindu astronomers The conception of a libration was, without doubt, suggested by the peculiar motion of the Pole of the Equator about the Pole of the Ecliptic

Precession plays an important part in various astronomical calculations Of this Rai Bahadur Jogesh Chandra Roy says in his introduction to the Sāhitya Darpana [1], "Before any reformation of the Hindu almanac is attempted, an exact determination of the amount of precession becomes a question of paramount importance In the Hindu system, the longitudes are measured from a fixed point—say a star—in the ecliptic, instead of from the moveable vernal equinox as is the practice in Europe The question has therefore the same bearing upon our calculations, as the position of the so-called First Point of Aries upon those of the Nautical almanac * * * The above fixed point is the starting point of our zodiac, and its longitude is known as ayanamsa, which literally means amount of solstices * * The exact amount of the ayanāmśa may be apparently determined in different ways First, the Siddhāntas furnish a rule for computing it, which is in principle the same as the method of finding the longitude of a star at any given date by applying the amount of precession to its longitude, at some other date Second, defining the initial point with the help of other data such as the recorded longitudes of stars, its present longitude from the equinoctial point may be ascertained Third, knowing the exact year when the initial point was fixed, its present longitude (Ayanāmśa) may be calculated from the known rates of precession. But it so happens that the results obtained by these three methods do not agree."

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[1] Jogesh Chandra Roy's Introduction to the Siddhānta Darpaṇa by Chandra Sekhar Sinha, pages 38–54

We have already said that the different astronomical works do not agree, either in the nature of the precessional motion or its annual rate. According to some, the equinoxes have an oscillatory motion, turning to the east and to the west of the initial point within certain limits, and extending over a large interval of time, while the others maintain their continuous motion backwards A comparative statement of the views of the libration and revolution theorists is given below [1]

	Annual Rate
Libration Theory	
Sūrya-Siddhānta	54"
Soma ,, ...	,,
Śākalya ,, ...	,,
Laghu Vāśistha Siddhānta .. .	,,
Parāśara ,, ..	52" 35
Āryāsta-Śatikā (quoted by Munīśvara)	46" 25
Revolution Theory	
Munjāla (quoted by Bhāskara)	59" 9
Bhāsvatī	60"
Grahalāghava	60"

For the third method mentioned above, we have to analyse the dates in which there was no ayanāmśa and we require also the rates of precession assigned by astronomers Munjāla is the earliest writer who has given the date of the year of no ayanāmśa, as well as the rate of precession observed by him. He wrote his work in Saka 854, and the precessional rate assigned by him was 59" 9 a year. According to him, Śaka 434 was without ayanāmśa The next work we should refer to is Bhāsvati by Śatānanda, which is still regarded as an authority for the calculation of eclipses, written in 1021 Śaka, this work gives the rate of precession to be 60" per year and the Śaka year 450 as the year of no ayanāmśa. The Grahalāghava, written by Ganeśa in Śaka 1442, gives the rate of precession to be 60" per year and Śaka 444 as the year without ayanāmśa.

The early Hindu calendar was computed with equinoctial or sāyana year According to this method of computation one year is the interval of time that elapses between two successive returns of the Sun to the vernal equinox, and owing to the precession of the equinoxes the year beginning had to be changed several times There are sufficient traces of these intermediate changes. Of all the ancient nations the Hindus alone had well nigh accurately determined the rate of the motion of the precession of the equinoxes Hipparchus considered it to be not less than 36", while the actual motion at present is 50" per year Ptolemy adopted, as observed by Whitney, the minimum of 36" determined by Hipparchus, and it is evident that the Hindu astronomers who fixed the rate at 54" per year could

[1] Colebrooke's Essay on the Equinoxes.

not have borrowed it from the Greeks. Owing to the shifting of the equinoxes the year-beginning was changed thrice and there are sufficient materials in the literature of India to corroborate the above assertion.

Let us refer to the tradition of Rudra killing Prajāpati, the god of time [1], for receding towards his daughter Rohiṇī The Aitareya Brāhmana (iii, 33) and the Śatapatha Brāhmana (ii 1 2. 6) describe this conduct as akrta (अकृत) or unprecedented and such as deserved severe notice by the gods "This gives the fact that the Sun was gradually receding towards Rohinī, by the precession of the equinoxes '[2] Prajāpati, however, was punished for his unusual conduct, and there the matter ended for the time being But the question was again taken up when the equinox had receded to the Krttikās · The seasons had fallen back by one full month, and the priests altered the year-beginning from Phālgunī full-moon to Maghā full-moon, while the list of Naksatras was made to commence from the Krttikās, instead of from the Agrahāyana * * * The calendar was mainly used for the sacrificial purposes and when the priests actually observed that the Sun was in the Krttikās, and not in Mrigaśiras when day and night were equal, they altered the commencement of the year to the Krttikās, specially as it was more convenient to do so at this time when the cycle of seasons had receded by one full month '[3] The Vedanga Jyotisa introduced the next change when the seasons had further fallen back, not by a month, but by a fortnight. Tilak says, "It was probably during this interval that the beginning of the month was altered from the full-moon to the new-moon, and when this beginning of the month was so altered, advantage was taken of the receding of the seasons by a fortnight, to commence the year with the new-moon in Dhanisthā as the Vedānga Jyotisa has done "[4] From this the next recorded step is to Aśvinī and this is the present year-beginning The present Aśvinī phase was introduced by Varāhamihira of Avanti in the beginning of the sixth century A D. Varāhamihira says in his Pañcha Siddhāntikā, "When the return of the Sun took place from the middle of Aśleṣā, the tropic was then right It now takes place from Punarvasu." Again in the Brhat Samhitā,[5] he mentions the same older position of both the solstitial points and appeals to his readers to ascertain for themselves by actual observation what position of the solstices is the correct one [6] There is, however, one interesting story related in the Mahābhārata referring to an abortive attempt to reform the calendar when the seasons had again fallen back by a fortnight

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[1] संवत्सरः प्रजापतिः । प्रजापतिर्यज्ञः । Ait. Br ii. 17, Śata Br. xi, 1.1.
[2] Orion, page 213 [3] Orion, page 215 [4] Orion, page 215.
[5] Brhat Saṃhitā, Chap III Verses 1 and 2. [6] Orion, page 35.

In the 71st chapter of Ādiparva we are told that Viśvāmitra attempted to create a new world, and to make the Nakṣatras commence with Śravaṇā, instead of Dhaniṣṭhā, and the same story is alluded to in the Aśvamedha Parva, chapter 44 [1] It appears, however, that he did not succeed, and the Kṛttikā system as modified by the Vedānga Jyotiṣa, continued to regulate the calendar until the Aśvinī phase was introduced by Varāhamihira.

The question of precession and libration of the equinoxes and the discussions thereon form an interesting part of Hindu astronomy and a careful study of all these observations leads us to the detailed regulation of Hindu calendar and sacrifices. We have, therefore, given here an almost continuous record of the discussions on the subject from the oldest time down to the present found in the astronomical and other literatures of India

[1] Orion, page 216

ARTICLE No. 34.

Remarks on Günther-Day Controversy regarding the Specific Validity of Hamilton-Buchanan's Cyprinus Chagunio.

By SUNDER LAL HORA

(*Published by permission of the Director, Zoological Survey of India, Calcutta*)

In the late sixties and early seventies great controversy raged between Gunther and Day, the two eminent British ichthyologists of the period, regarding the relations between *Barbus beavani*, Gthr and *Cyprinus chagunio* Ham Buch The details of this dispute are recorded in the *Proceedings of the Zoological Society London.* Recently there have come to me certain facts bearing on this point and I have taken the trouble necessary to go into the matter fully Having the facts at hand I have thought it worth while to make a record of them here

In 1868, Gunther in his Catalogue (VII p 96) described *Barbus beavani* from two specimens (one 'adult' 145 mm, and one young) collected in the "Cossye River" and presented to the British Museum by Lieut R C Beavan At the same time Gunther considered *Cyprinus chagunio* of Buchanan a doubtful synonym of *Barbus clavatus* McClelland (p 97). In 1869, Day while writing notes on the fishes of Orissa (*P Z S* , p. 373) relegated Gunther's *beavani* to the synonymy of *chagunio*. A large number of young specimens of the species up to 3·5 inches in length were collected by Day at Midnapore in the Kossye River, but he mentioned that the species is said to grow to 18 inches (Buchanan also mentions that his *chagunio* attains to about a foot and a half in length) In the course of certain "critical observations" made in the "Zoological Record" for 1869 (p 136) Gunther doubted Day's determination and pointed out that "a fish described as having large scales and minute barbels is not likely to be the *B. beavani*" (both the characters referred to here are taken from Buchanan's description of *Chagunio*). In 1871, Day, in order to confirm his determination, referred to the MS drawing of "? *C chagunio*" in the possession of the Asiatic Society of Bengal (*P Z S* , p 637), but Gunther deferred the consideration of this point in his notes published in 1871 (*P Z S* , p. 764) until he obtained a copy of the drawing referred to by Day. Having obtained an "Accurate tracing in pencil of the drawing" from Mr. J Wood-Mason, Gunther again takes up the subject in 1872 (*P.Z.S* , pp. 875-878)

and gives a figure of the head and of the dorsal fin of the species He admits that the species figured by Buchanan is the same as his *beavani*, but he does not consider it to be identical with Buchanan's *chagunio* His judgment was based on the fact that the barbels in the drawing are not minute as described for *chagunio* and secondly the drawing represents only 11 rays in the dorsal fin and not twelve as in *chagunio*. He also directs attention to the name "*Cyprinus Runt*" given on the drawing.. . "a name which does not occur in Hamilton's works, but which is evidently the same as *kunta*" Lastly Gunther points out that *C kunta* was considered by McClelland (*Ind. Cyprinidæ* p 340) to be a synonym of *Cyprinus sarana* Ham Buch While intimating to the Zoological Society the discovery of "the long-missing papers of Dr. Buchanan on natural history" in 1873, Day offered certain remarks on the "Fishes of Bengal" based on extracts from Dr Buchanan's manuscript notes (*P Z S.*, pp. 743–748) Among his remarks he refers to this controversy again (p. 745) and gives three vernacular names for *chagunio* viz , *Gărhàn* at Puraniya *Daranggi* of the Tista and *Kunta* of some other places The following statement occurs in a foot-note on p 746 · "The native name *Chaguni*, employed in the 'Fishes of the Ganges,' finds no place in the MS notes, but this is by no means a solitary instance However, in the MS notes the *Kunta* is the only fish likened to the *C curmuca*, and in the 'Fishes of the Ganges' the *Chagunio* is the only fish compared to the *Curmuca*, whilst *Kunta* and *Chagunio* are both on the same drawing, the first name is only found in the MS notes, the second only in the published work " In the *Fishes of India* Day justifies his identification and leaves his critics to answer the following two questions (p 560) . "If *C. kunta* is not *C chagunio*, what does it represent ? and where is the figure of *chagunio* ?"

It is, therefore, clear that the points raised in this controversy could be settled if a reference had been found to the local name *Chaguni* in Buchanan's MS. notes I have great pleasure in announcing that a very clear reference on this point is found in the manuscript volume of the original notes concerning the Gangetic Fishes in the Library of the India Office The name *Kunta*, *Chaguni* and *Daranggi* are found in one place above the description (in Latin) of *Cyprinus chaguna*, which name in these notes replaces *Cyprinus kunta*. *Kunta* appears to be the name of the fish at Dinajpur, *Daranggi* at Baruni and *Chaguni* is the name in the Yamung River Among the habitats of the species are mentioned Tista, Kosi. The most noteworthy entry here is D 11, A 8 How Buchanan came to describe twelve rays in the dorsal fin when he noted down only eleven in his notes is a mystery to me It has already been shown by Day (*P.Z.S.*, p. 746, 1873) that the descriptions of the Gangetic

Fishes are full of such mistakes. This incidently clears up another point of contention between Gunther and Day I need to refer here only to the dispute over "Has *Cyprinus bata* (Ham Buch.) nine or ten branched rays in the dorsal fin?"[1] which can be followed by a perusal of the papers cited above

There seems to me no doubt that *Barbus beavani* Gthr is identical with *Cyprinus chagunio* Buchanan I have verified this fact by an examination of the types of *beavani* in the British Museum of Natural History

I have referred to this discussion at some length firstly in order to clear the specific validity of *Barbus chagunio* and secondly to direct attention to the great harm that has resulted to science by the withholding from Buchanan of his drawings of natural history objects It is after a lapse of over a century that an indisputable taxonomic position has now been assigned to a common species of considerable economic importance in India

I have here to offer my sincere thanks to Mr J R Norman for the facilities so kindly extended to me for work in his department

British Museum (Nat. Hist.)
August, 1928.

[1] In the original notes there are two entries regarding the number of rays in the dorsal fin The older one is as follows "pinna ani radiis 8 dorsi 12," but a later entry is, "radiis dorsalibus 11 seu 12 analibus 8"

Marriage Customs in Behar.

By KALIPADA MITRA

The following general observations have been based upon enquiries made amongst Bihari Kayasthas

In the selection of parties to the marriage the four *houses* are abandoned, *viz.*, persons consanguinely related to (1) the bride's father (2) his maternal grandfather, (3) the bride's mother, (4) the latter's maternal grandfather, similarly these relations of the bridegroom must not be common. This exclusion is technically called *gharavarjani*

[Amongst the Brahmans of the Bhagalpur Division *gharavarjanî* is limited in the following way, *viz*, persons consanguinely related to the bride's father and mother and those consanguinely related to the bridegroom's father and mother up to the seventh degree in ascent must not be common Besides the *gotra* and the *mûla* must not be identical, or in other words the descendants of the first ancestral father or eponymous ancestor and the first ancestral mother must not be bound in wedlock.]

Then the horoscope of the parties is consulted If nothing is amiss, then the *shagun* ceremony is fixed A priest, a barber, and any relation of the bride,[1] *e g*. her brother, go from the bride's side to the house of the bridegroom The latter gives five handfuls of paddy, *pân* (betel) *supâri* (betel nuts) *dub* (*dûrvâ cynodon dactylon*), turmeric (*curcuma longa*), and coins into the hands of the priest With the following benedictory verse —

Mangalam Bhagavân Visnu
Mangalam Garudadhvaja
Mangalam Pundarîkâksa
Mangalam tanoti Hari

the priest sprinkles on the bridegroom the contents in his hands The ceremony is in fact tantamount to an announcement to the village that *tilak* has been fixed, and arrangement for marriage has been made

Then follows the *Tilak* ceremony An odd number of people, headed by or in company with, the priest start at an auspicious moment from the bride's house with presents and proceed to the bridegroom's The things are placed at the yard of the groom on a spot which was previously scrupulously

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[1] But custom differs, it is not necessary *Shagun* is not observed amongst the Brahmans; consulting the horoscope is optional

The scattering of the pulses seems to be a magic device of charming away the evil and bringing in of good luck and protection from harm which appears to receive corroboration from the explicit invocation to the guardian deities of the quarters for protection

On return they put in some unhusked paddy, often red, in a *Ukṛi* (wooden mortar) Five women and the bridegroom together hold the *samât* or *musal*, *i e*, the pestle, and strike together the contents five times Then with *one hand* each takes five or seven grains of rice thus husked out of the *ukṛi* All these rice grains are placed on a mango leaf which is then rolled up with a red string and wound round the wrist of the bridegroom who takes it off only on the fourth day of bathing after the marriage

According to some this ceremony takes place at the *janvâsâ* Eight men including the bridegroom strike the paddy eight times This is called *athongar* If it be the bridegroom's first marriage then all the seven other people must be 'first married' *Non*-married persons must not participate in the ceremony In case of the bridegroom's second marriage the people may be 'first-married or 'second married' This looks like an instance of homeopathic magic

The working of the husking pestle and mortar, the anointing of the bride and bridegroom with exchange of unguents in most places, and the several ingredients used in the ointment such as barley, turmeric, etc. credited with evil-scaring and vegetative properties make up an elaborate fertility charm [1]

Following the *daldhoi* the *mâdwâ* ceremony takes place A *mâṛwâ* (*mandap* or *yajñaśâlâ*) is raised Earthen elephants and other earthen wares are placed and worshipped *Dhân* (paddy) of natural red colour is placed on the elephant which supports a *hândi*, on which a lamp is lighted. On the top of a *kalasa* (jar) which is filled in with water consecrated by *mantra* is placed an earthen lamp having four beaks (*caturmukhi pradipa*) fed with ghee On the return of the bridegroom from the marriage both husband and wife are bathed with water poured by his elder brother or his maternal uncle over them from the earthen jar The bridegroom's party feed all his caste-people on the *mâdwâ* ceremony day The *mandapa* is specially very important at the bride's house, where it is decorated as splendidly as possible, especially because at this place the marriage is performed

Associated with this is the *hardi-chaṛâonâ* ceremony Some turmeric (*hardi*) paste is liquefied and in this liquid a stone is placed on a plate. People make presents Then follows

[1] Crooke, *Religion and Folklore of Northern India*, 1926, p. 245

the *ghî-dhâri* ceremony. Some *ghee* is dedicated to the *kula-devatâ* or the household deity, which is then poured over the bridegroom by his father and mother who should fast. Sometimes the brother or the uncle officiates. Songs are sung at the time. The *uviana* is suspended on this day. *Ghi-dhârî* is not performed for the bride on the same day. When the bridegroom's party is in sight in the village of the bride, this takes place at her house. *Ghî-dhari* happens once in the life-time of the groom, hence in case of his second or subsequent marriage this is omitted.

Kayastha grooms whose family custom is to wear *janau* which is ceremonially performed omit *mâdwâ* and *ghî-dharî* ceremonies, especially the Karana Kayasthas.

On the next day the interesting ceremony *pânikâtâ* (lit. cutting the water) is gone through. *Pâtwâsi* (a brow-plate made of cork) is hung on the brow of the bridegroom by his sister (or in her absence, his father's sister) and his sister's husband (or in his absence, his father's sister's husband). They start with an earthen pot or *lotâ* to a water-place (which is generally resorted to on marriage occasions) accompanied by a procession of females. The sister's husband has a sword in hand on the point of which is fixed a *pakwân* (some cake of flour cooked in ghee), or *mangior* (balls of flour cooked in ghee), which must have been offered to the *kuladevatâ* at the time of the *ghî-dhârî*. He draws water and pours it on the blade of the sword which is held on an earthen pot (*cukdi*) with its keen edge upward by the sister so that the water divided by the edge (lit. cut) falls into the *cukdi*. The water accompanies the bridegroom's party (barât). The ceremony is also performed at the bride's house.

On return the rite of *lâvâ-bhuñjâ* (the frying of paddy) is performed. The sister's husband sits on a *morhi* (grainstore) made of straw. On a new oven which must face the north is put a new earthen pot on which the groom throws a few handfuls of paddy at intervals. The sister fries the paddy and the husband stimulates the fire in the oven. The fried paddy is then sold by the sister's husband to the groom, and his father, mother and relatives also purchase it for money.

The water of *pânikâtâ* and the fried paddy accompany the *barât* and are subsequently used on the *vedi*.

In some places two days before the bridegroom starts for the bride's village an interesting ceremony (*vidh*) takes place. This is called *âm mahuâ kâ bihânâ*, or the marriage between the mango and the mahua (*bassia latifolia*) trees. Before starting for the place the elder sister of the groom puts collyrium (which charms away evils) on his eyelids. He holds in his hand a knife on the blade of which is fixed a betelnut. The sister holds in her hands the half portion of a yellow cloth, the other half of which is placed on the head of the groom. He then starts followed by her. The female relatives of the groom take him

to a place where mango and *mahuâ* grow With a branch of the mango vermilion is placed at the foot (lit. *jaḍ*, root) of the *mahuâ*. The mango in this case is the male and the *mahuâ*, the female party The ceremony is regarded auspicious and I think is an instance of sympathetic magic The object may be to secure the spending out of all malignant influences, if any, on this preliminary tree-marriage so that the actual marriage becomes unimpeded and smooth in its course, or it may be a case of fertility charm Instances of association of the tree with marriage in varying forms have been given by Crooke [1]

Just before the groom starts for the marriage from his house the nails are pared by the barber and he is shaved This is called *nahsu* or *nahchu* At this time the bridegroom is blindfolded and the little finger of his right hand is slightly punctured. The blood is drawn on a betel leaf which is subsequently administered to the bride in the belief that mutual love between the pair will increase Similarly the little finger of the left hand of the bride is punctured, the blood drawn on a betel leaf and likewise administered to the groom This administering is pretended to be clandestine, and the persons do not know it This process is technically called *Sineh kâdnâ* (increasing of love) This is also variantly called *yog pilay* (lit. union drink)

Then a washerwoman bathes the groom who is seated on a *pâlo* (yoke) (in some places the yoke is put on a small pit dug for the purpose). With *kâjal* or collyrium the eyelids are painted Music accompanies When the groom sits in the palanquin just before starting, his mother comes and applies her teats to his mouth This probably serves to remind the son of his primary duty of affection for the mother and his love should not be wholly monopolised by the wife he is going to wed, or this may be a magic in disguise established by the superior claims of the mother to the love of the child over that for his new wife.

After the *pânikâtâ* ceremony at the bride's house the party return from the water place to the house and then the women start in procession in the direction from which the groom is expected to come Accompanied by music and songs they go outside the village in the fields. Then some female lies down with the *cukdi* containing the water of the *pânikâtâ* ceremony under her bosom The mother carries the bride in her arms and leaps over the lying female The bride's brother brings a sprig of *cidcidi* (*apâmârga, achyranthes aspera*) to the party This is called *yoga mângnâ* (or praying for the union).

Apâmârga is largely used in magic In the *Atharvaveda*

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[1] *Op. cit.*, pp. 404, 415.

(IV 17) its use is prescribed in warding off death causable by hunger and thirst, *sterility*, want of cattle, etc along with charmed water in which *darbha* (*poa cynosuroides*) and *sahadevi* have been put. In the *Atharvaveda* (VII 65) it was used in baffling the effects of curse The whole ceremony in which the consecrated water of *pânikatâ* is used, the mother leaps with the bride over the prostrate female, etc looks like a magic performance to ward off evil from the bride, to keep from harm the direction from which the bridegroom comes to secure a successful termination of the engagement, and to prevent dangers of sterility.

When the *baral* arrives at the village of the bride and before it is accommodated in the *janavâsâ* (temporary quarters), the bride's party sends a letter to it known as *bara nimantrana* (lit invitation to the *barât*)

Then the bride's father and the groom's father meet and the former pays money to the latter This is known as the *samdhi milan* (or the meeting of *Vaivâhikas*)

The *barât* then comes to the *janavâsa* or temporary residence for the bridal party to put up

Meanwhile the groom is carried in a *pâlki* (palanquin) to the door of the bride's house, and the interesting rite of *dwâr-lâgâi* is then performed The bride's father, or in his absence any other relative, gives money or any other presents to the groom Some one then brings milk from the teats of the bride's mother, or in its absence some *sherbet* which has previously been touched to her teats This the groom drinks This is a sort of affiliation and the groom is regarded as the son of his being mother-in-law Then he returns to the *janavâsâ*

Now when all are in *janavâsâ* five (or even one) maid-servants of the bride's party accompanied by the priest and the relatives of the bride go there They carry on their heads five (or one) pots (or pot) filled with water and covered over with one piece of yellow cloth. The woman in front carries a sword in her hand (but the practice is not invariable) They are received by the groom's party and paid in coins This is called the *dhoyâpâni*. The priest of the groom asks the fore-woman of the party thus

Q Whence do you come ?

Ans From Kâmarûp.

Q And for what purpose ?

Ans To seek the groom for the bride, or after touching the bride we have come to touch the groom

After this conversation *uviana* is scattered among the *barâtis*.

It is well known that Kâmrûp is regarded amongst the Hindus to be the land of magic and *tantras*, and believed to be the place where youngmen going there were turned into sheep and kept under complete control by the fair damsels of that

fairy land The insinuation is that the husband would be sheepish and quite submissive to his future wife, perhaps credited with all conceivable Circean charms.

Then *bahas* or intricate questions and their answers are exchanged between the parties, as merry intelligence tests, for the questions are so designed that they are riddles and enigmas and are difficult to answer

After the return of the females of the *dhoyâpâni* the groom in a *pâlki* is borne by carriers (of the Kâhâr caste) of the bride's house He is there received by the females, and then his *ârati* or *parchhanâ* takes place. On a plate are put betel, ghee, lighted camphor, *dub*, curds and *âruâ* rice All the women, with hands or with leaves of *pân,* warmed over the light, individually foment the cheeks of the groom and put a mark of curds (*dahikâ tikâ*) with finger tip on his brow. This is called *gâlseti*

The *ârati* is a mode of worship or a manner of showing respect to gods or to those to whom honour is due The *mantras* of the marriage show that the bridegroom is regarded as an honoured guest who deserves to be welcomed in the way mentioned above or it may have a magical significance. N. M. Penzer says.[1] —

In Upper India the customs at Hindu weddings connected with the warding away of spirits is called *paracchan*..." or it may be a charm against the evil eye.

After this the mother-in-law comes and spreads her apron before the groom who throws therein a whole *hândi* of sweets Images of Hara and Pârvatî made of *âtá* (flour) taken there by the groom are then given to the mother-in-law.

Then follows *pân bichchhi* or the scattering of *pân* leaves. The groom alights from the *pâlki* , the bride then gets in there accompanied by her elder brother's wife, or in her absence, her mother A woman on each side of the *pâlki* stands holding a new and a turmeric-tinged cloth passed underneath it. Then the bride throws five betel leaves on one side They are picked up by the groom and handed over to the bride who again throws them on the other side. The groom goes to that side crawling under the *pâlki* and again picks them up and hands them over to the bride. During this process he is beaten with a shoe by his brother-in-law. The mild form of the treatment is salutation to the shoes by the groom I doubt not that this is intended to bring in good luck just as in English weddings this is lustily practised for the same purpose as I have been informed by an Englishman. Is it a form of flagellation which is reputed to chase away evil spirits or evil influences and thereby bring in good luck ?

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[1] N M Penzer, *Ocean of Story,* Vol. VI. (1926), p. 109, Footnote 1. See also Crooke, *op. cit* , p 293.

Then the bride and her *bhojâi* (brother's wife) sit together, or lie together, covered over with a cloth and then the groom is asked to find out his wife. The *bhojâi* kisses the bridegroom Sometimes a lad takes the place of the *bhojâi*

When the bridegroom comes to the *mandap* he is presented with a new cloth Seven married men and the bridegroom place eight handfuls of red paddy in a *ukdi* They are bound round by a thread by the priest They then hold the pestle together, strike eight times the contents, take a few grains of rice which are then wound up and strung round the wrists of the bride and the bridegroom

The most important ceremony takes place at the *mandap*. To the accompaniment of the recitation of sacred texts the priest places the hand of the bride on that of the groom and both their hands rest on the upraised palm of the bride's father This is *pānigrahana* or the taking of hands. Water is then poured by the father through a chank which is placed on the hand of the bride who is embraced by the groom. This is called *Śankhpâni* In the absence of the father, the brother or any other relative officiates This is the celebrated water of donation (*daksinodaka*) which from time immemorial sanctifies all gifts, and therefore, also the gift of the bride [1]

Then the *agnihoma*, or sacrificial fire is lighted and the necessary ceremony follows. The bridegroom and the bride then circumambulate the *Vedi*, or step what is known as the *saptapadi*, or the seven steps, this is also called the *bhāmar*, or going round. They do it seven times The bride steps in front with the groom behind who holds a hand of the bride in his own

Thereafter fried paddy is scattered round. This is called *lâvâ-chitnā*. A small winnowing fan (*sūpa*) is placed on the hands of the bride, and on the fan some fried paddy (*lāvā*) is placed by the bride's brother. It is then scattered round This has also a magic significance, *viz.*, evil scaring This is also regarded as a fertility charm by Dr. Crooke [2]

Then the ceremony of *sindurdāna* or the application of vermilion takes place The bride's brother and his wife spread a thin cloth, held at both ends by them, over the head of the bride, which is uncovered, just close to and above her eyebrows The vermilion on the cloth is stirred by the groom which falls on the point of the parting of the hairs of the bride Or vermilion is applied by the groom with a flaxen pellet (lit Ś'an), or a fruit called *sohagilla*, or a small ring, to the *sithi* (parting of the hairs).

After *Sindurdān* when the pair are taken to the *Kohbar* or the marriage bower or the chamber, the bride's brother makes a feint of opposing the procession He is pushed away and the party proceeds to the *Kohbar*. This is a reminiscence of

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[1] N. M. Penzer, *Ocean of Story*, Vol VII, p. 79. "She brought water and poured it on the hand of that thief and said: 'I give you this my maiden daughter in marriage'."

[2] *Op. cit.* p. 327.

marriage by capture The bridal chamber is sometimes decorated with *âlipanâ* painting, done with finger-ends dipped in a solution of powdered rice, on the floor and the walls of the room

Marriage takes place both at day and night.

We have already noticed the peculiar rite of drinking the blood as *yoga pilây* (union drink), or *Sineh Kâdnâ* (increase of love) drawn from the punctured little finger of the bride and the bridegroom In some places, in addition, another sort of love potion is administered Leaves of sensitive plant (*lajauni, mimosa pudica*) together with other herbs, are ground with water and made into a potion which is offered to the groom at the bride's house by the *vidhkari*, or one who performs the rites

The custom of mixing or exchanging blood prevails among certain Bengal tribes F. C Conybeare alludes to the custom in Brittany where the bridegroom sucks a drop of blood from an incision made below the bride's left breast.[1]

Then there is the practice of application of vermilion, or the fixing of *tiklī*, or spangles worn by Hindu women of good caste, which forms part of the *sohāg* or the lucky trousseau It is affixed to the girl's forehead at the marriage, and is worn until her husband's death The basis of *tiklī* being vermilion, if it is worn, vermilion may be dispensed with [2]

Evidence seems to point to the fact that all these uses of vermilion or red lead are later survivals of the original blood rite by which a woman was received into her husband's clan. This explanation has not however found universal acceptance, and Westermark (*History of Human Marriage*, vol III, pp, 446–448) considers that colour red is used in marriage rites in circumstances which do not allow us to presume that the use of it is the survival of an earlier practice of using human blood Although he does not advance proof to the contrary, he gives a large number of useful references on the use of red in wedding rites. Dr. Crooke in a paper on "*The Hill Tribes of Central Indian Hills*" (*Journ. Anthropol Inst Gt Brit*, New Series, vol I, 1899, p. 220, *et seq*) in which he mentions a case of marriage by capture in which a Bhuiyār girl wrestles with a youth as he applies vermilion to her hair He says "More obvious still is the motive of the blood covenant Here we can observe the stages of the degradation of custom from the use of blood drawn from the little finger of the husband which is mixed with betel and eaten by the bride among some of the Bengal tribes (Risley, *Tribes and Castes of Bengal*, ii 189, 201) The next stage comes among the Kurmis where the blood is mixed with lac dye, lastly comes the rite common to all the tribes, by which the bridegroom, often in secrecy, covered by a sheet, rubs vermilion

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[1] F C Conybeare, *A Brittany Marriage Custom in Folklore*, Vol. XVIII, p 448 (1907)

[2] N. M. Penzer, *Ocean of Story*, Vol II, p 22 ff.

on the parting of the girl's hair, and the women relatives smear their toes with lac dye—all palpable degradation of the original blood rite That this rite is sacramental is clearly shown by the fact that the widow after her husband's death solemnly washes off the red from her hair, and flings the little box in which she keeps the colouring matter into running water [1]" I have myself seen that when a Hindu Bengali husband of the Kayastha caste was dead, on the litter on which his corpse was placed, was put the *Sindur Kautā* (box) which was consumed along with his mortal remains

Blood covenant was necessary in an age of distrust and mutual hostility and solemn pacts were entered into by the transfusion of the blood of the covenanting parties into each other's veins, which knit them together for life.[2] Amongst many tribes this is still practised, commonly styled "blood brotherhood," or if the parties be a male and female, they are looked upon as brother and sister, who though belonging to different septs or different tribes are faithful to each other unto death and never do an unfriendly thing

From the time of the Atharvaveda down to our modern days numerous devices are practised as love charms and the literature is redolent of them

The bridegroom is invariably accompanied by his younger brother or some young person as he starts for the bride's house called *Shāhbalâ*, 'corresponding to *Nitbara* (in Rádh, Bengal) or *Mitbara* (*mitra-bara*, friend of the groom, being his playfellow of younger days) in Bengal Does it point to a relic of the one-time prevalent custom so widely practised of the levirate ? The rather free behaviour of the wife towards her husband's younger brother noticed in the account of kinship relations of various tribes, and races—her potential future husband—tends to add strength to the hypothesis

The sister of the bridegroom figures prominently in some of the marriage rites, *e g*., *Dâl dhoi*, *lâvâ bhunjâ* and *âm-mahuâ kâ vihânâ* ; the sister of the bridegroom's father takes the next place. It is the lingering trace of matriarchate in these rites.

I am appending eighteen marriage songs some of which have been collected for me by my student, Chandrika Prasad, for which I am very much thankful to him.

I have tried my best to translate the songs which also I am appending. I hope I have succeeded in preserving the sense, though, perhaps, I may have erred in one or two words or passages

The songs possess a charm all their own, both for the quaint language and the sense they convey

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[1] *Ibid loc cit.*

[2] Frazer, *The Golden Bough* (1923), pp. 202, 113

APPENDIX A

TEXT OF MARRIAGE SONGS.

(1)

General Songs.

Rājā Janakjī ko kanyā kumārī,
ghar ghara pãhāti pathāvata hãhai,
Raghunandana candana khabar diyo,
gajavāji uḍāvata āvata hãhai

Rājā Dasrathajī ko cāriyo putra,
Raghuvara cāpa cadavata hãhai,
Raghunandana candana khabar diyo,
gajavaji udāvata āvata hãhai

Yo bariyāt sadaka bic ayo,
rāhi musāfir gher liyo,
Raghunandana candana khabar diyo,
gajavāji udavata āvata hãhai

Yava Raghunāth bangla bic ayo,
Sālā sasuran gher liyo,
Raghunandana candana khabar diyo,
gajavāji udāvata āvata hãhai

Yava Raghunāth mandap bic āyo,
pandita veda padhā vata hãhai
Raghunandana candana khabar diyo,
gajavāji udāvata āvata hãhai

Yava Raghunāth kohbar bic āyo,
sālī sarhajan gher liyo,
Raghunandana candana khabar diyo,
gajavāji uḍāvata āvata hãhai

Yava Raghunāth mahal bic āyo.
choṭī aisī līulo ne gher liyo,
Raghunandana candana khabar diyo,
gajavāji udāvata āvata hãhai

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(2)

General Songs

(Kumārī gīt).

Thadokhā baithali Sītā sundarī, kānta dekhi naynā dhare,
Pātar hāi Raghunandana , kathina dhanukhā bhaye
Eho dulahā yava hāri hãhai, kona vidhi viyāha huye,
Rāmhi toḍlā dhanusa oahīu, Muni śav jay jay kare
Parasurāma khabar janaulā, Rām Siyā viyāh huye.

(3)

General Songs

Janak gṛha Sītā Kumarī aur Rāma dulahā bhaye .
Muni sava mil sava hāla likhi patra Avadha cale
Munike vacana yava sunala Rājā, mana cita haraṣita bhaye,
Dālā bhari sonā denge mālin, ajab jahāja bane.
Māli gutho campā maurī, sonekā chatia dhare,
gajbar diyā hāi nagādā, nṛpati bariyāt cale.

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(4)

Tilak Song.

Ganapati carana manāiye rāciye, sārise sohāg kiyā sāi ise,
Sohāg Rukminī Kṛsnaker se kāminī ihīhā dahi de janamdohri,
Rācahi ko iasakām koi sakhi he sājahi devāi patiā manāi ke,
Koi hasti cadke dān dije Iśvar Rukminīke,
Rukminī ker viyā ha Rukmā gaja thīhād hoye thān Rukmā jo thai
Rukmā jo de tavse Sisupālse
Āh Rukminī jo vāt janāve, Kṛsna āye duāre āye.

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(5)

Tilak Song.

Janak Kumarī ko viyāha, so mangala gāiye gāyi
Mangala cāhu yuvatī yuvatī mukha añcala divo, cīrā pahirau
kanak ābharan pān mukh me bhari divo
Śri śobhe sindur bindui iabiyau ugi parāte āye,
Candar badan utejita unko, pulakita sur gāyiye
Lāl piyar khule madvā pān mukh me bhari divo,
Cirāpahiran kanakābharan, pan mukh me bhari divo
Kanak thambh besi tar kanake kanak kalsā yahmā, dhar bharpui
jalkar āmiapal haldi upar phulhar dhare,
Purahar te tāpus chāiye vipara bolaiye, vidhi se choukā purāiye,
viprā bolāiye.

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(6)

Tilak Song.

Ganapati gahiye Gaṇeś, Iśvara gahiye Gopāl
Se Sītāker dulahā nandan, nahi e jagatai cand,
Iye Sītāker nātha sanātha hīhai, Raghukula ke ānand.
Avadhpati, Avadhpati, ānaho bolāī ho,
Āhe nanhā sana purukha Raghunāth, tāke vijaya āye.
Baitho Rām sambāro āsan, jhalak hīrā lal dai ,
thār bhari gajmoti ānala, hīrā mānik lal hāi
Āhe, mālīnīke paral hai kār sirahi bhari sindur,
hāth hastinī diyo kanthe vāje nepur vāje hai,
harakhi ke jab calala malinī, Rām Candra dohāi hāi,
Āho, malinīke āro cāhīye pator sirahu bhar sindura hai.

(7)

Lagan Song.

Subhа gharı lagan dhaıão, viyãhan cıravı rakhãvan ;
Govarahı angnä nipão, gajomotı caok purão.
Suvaranahı kalasa dharão, dīpa varão, Raghunātha—
viyãhan cıravı rakhãvan
Anı baıthão Dasrathjīke betā, matıyan ājhurı bharão,
Ānı baıthao Janakjīke betī, sındurani mãngıyã bharão
viyãhan cīravı rakhãvan
Ānı baıthävala dulıaıtā Bābuko, matıyan ajhurí bharāvala,
Ānı baıthävala duları betıke, sınduranı mãngıyä bharāvala
viyãhana cıravı rakhãvan

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(8)

MARRIAGE SONGS

Beṭe Kā sehlā.

Khojšte khojote mālıı sahaı paısgele Āre kaun Rājā ghar śādı re.
Motıdaıse guthegā sehla, guthılā āure merī gorī mālınıyā
Eh dekhun malını uhe darwājwā

Hāthı lade ghodā aveıo, Āıe hāthı ghoda āvore,
Motı darse guthegā sehlā guthılā auro merī gorī mālınıyā

Avo āvo malını bete darwajwemo Āre, karu bhārı yakī mōl re,
Motı daıse guthegā sehla guthılā āure merī gorī mālınıyā

Lākhou mālını mol kaıatuhaın. Āre, āre, nav bābā dilā aur āre nav cācā dilā, aur motı daıse guthegā sehla guthılā āure merī gorī mālınıyā

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(9)

Bete kā sahānā

Sonā ke khadınā cadhı thād dulrāıta Bābu,
Malıyā malını bihı ek pāre, ge maı,

Malıyā je sutal bāgıe bagıcvā
Mal nı sutal phulbarıyā ge māyı

Uthı kihaye mālını malıyā jāgāvaye,
Duāre dulraıtā Babu thād, ge māyı

An toj āre gamruā galıyiho na āvayo,
aju kaıse duare hı thad, ge māyı

Kıya tōı ghatlo gamru gaḍ re gadpuā,
Kıyātor bhatıjā mudanviā, ge māyı

Nahı mor ghatle mālınıyā gaḍ re gadpuā
Nahı mor bhatıjā mudanvā, ge māyı,
Hamrāhiu ghar mālınıyā laganā utahul,
Aıo gaj maunā guthı deho, ge māyı,

aıo gaj aıo gaj ghosiboho dularuā,
aro gaj mor kaısan hoı, ge māyı

Ātho hāti guthi hāi mālıniyā ālre jhālre
Bic me guthal cũād surajvā, ge māyi

Sehe pahari vava nikau Rāmji Bābu,
Mohi rahle parivārvā, ge māyi

Bāt hi rijhato dularuā bāt re batohiyā,
Kihuyeviha rijhato pāni bharni, ge māyi

Māḍvā hi rijhato dularua beti ke bāp,
Vedī tai beti ke māvi, ge māyi

Kohbar rijhato dularua sāli sarhajiyā,
Palanga rijhato dulhiniyā, ge māyi

Dhany tohai māyi dularuā dhany tohai bāp,
Jihi kokhi lekhe avatar, ge māyi

Yakhni hi jinmā mori bari re vayasvā,
Pair gholiye gholi pailau, ge māyi,

Kuchhu khaili kuchu pair paili
Kuchu pair dui dhalkailau ge māyi

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(10)

Ganpati ji kā—utan lagānke samay gāyā jātā hai.

Śri Ganpati vandiye Hari Hari
Tahiṅā venī nidhir mandap cāiu
Lagāiṅo Hari uvatana
Tahiṅā gāi ke govar angnā lipaiṅo
Lagāiṅo Hari uvatana
Tahiṅa gajmoti cauk pūrāiṅo
Lagāiṅo Hari uvatana
Suvarn kalas' lihaye pūrhar dharihu
Lagāiṅo Hari uvatana
Tahiṅā manimaya dīpa bharāye
Lagāiṅo Hari uvatana
Sonā ke sīhāsana asana laymu
Lagaiyo Hari uvatana.
Tahiṅa Rādhe Kṛsna āni bithāval
Lagaiṅo Hari uvatana
Yav aur gahiṅuā ker uvatana lagāiṅo
Lagaiṅo Hari uvatana
Tahiṅā raisarisvā tel
Lagaiṅo Hari uvatana
Sonā ke sinduria bhari sindura
Lagāiṅo Hari uvatana
Tahiṅā piāe sohāgin mangal gāval
Lagāiṅo Hari uvatana
Tulsidās prabhu eho mangal gāve
Lagāiṅo Hari uvatana
Tahiṅā le darpan mukh dekhiṅo
Lagāiṅo Hari uvatana

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(11)

Mandapa Song.

Mādvā sobhe Rām Jānakī,
Caukāb aithe samadhi samadhin.
Janakgrhame cahal pahi ;

Bhūpa sajike barāt āyo,
Suyana amrta yahīnā rahe,

Barāt sarāt siha bhāmari khulīnahi,
Mādvā sobhe jodi.
Ranga kesari pag jāmā,
Kān motihu lahi,

Dasratha Janaka parbodhiye,
Bhayo man māni.
Sira dina sindur Rām dulahā
Sīyā sundar khulīnhi,

Vāju vāju Janaka gana guna karu,
Nita amrta jaya bolo:
Sīya Rāmse ānanda bhayo,
Suralokse phul jhari paro

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(12)

Āsirvād—biwāh ke samay.

Hari bol sindurā dān
Gayā Gajādhai Pariyāg Mādhav
Har lā joti Baijnāth
Rām yuge yuge tohar ehivāt
Rām yuge yuge

Badi tap kailehe rāni, gauri rāni,
Swāmī milalo Bholānath.
Rām yuge yuge tohai ehivāt,
Rām yuge yuge.

Jithūm Iśvar Mahādev rani
gaurā ke ehivat,
Rām yuge yuge tohar ehivat,
Rām yuge yuge

Badi tap kailehe Rāni Rādhārāni Pyārī
Svāmi milalo Krsnacandrajī
Rām yuge yuge tohar ehivāt,
Rām yuge yuge

Yuge yuge jivahūm Śri Krsnacandraji
Rānī Radhikā Pyarī ke ehivāt
Rām yuge yuge
Tohar ehivāt, Rām yuge yuge

---

(13)

Cumānā Song.

Śrī Rāmjīke sehlā virāje,
Ek tilak sobhe lilār,
Cal ho, sakhi, Rām cumāve.

Kānahī Rāmjīke sonā virāje,
tilak sobhe, lilār
Cal ho, sakhi, Rām cumāve,
Cal ho, sakhi, Sīyājī cumāve.

Ramjīke sirapara chatra virāje,
Sīyā gale vana māl,
Cal ho, sakhi, Rām cumāve,
Cal ho, sakhi, Sīyājī cumāve

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(14)

Kohbar Song.

Pihāc gotā guebā pihacsé gotā pān,
pālanga baithal hain Ramji Bābu
khade guā pān,
Palangā baithal hain Ramji Bābu khade guā pān,

Maciyā baithahli hain Sītā pyārī Rānī badana nehāri,
Kiya mukha āhe prabhu kunno kunāvāl,

Kivā mukha āhe prabhu gadhle sonār,

Ābujha āge Rāmi ābujha ajñān
Manusya āge dhāni na gaḍhe sonār,

Nagr buliye buli bole kotvāl
Rājā ghare ahe Rāmji Bābu paral hankār,

Man mor dāgā magā citta hai udās
Aisani sundarī chori na jāiba divan .

Divān jāibe he prabhu khāibe guā pān,
Baithale cautr cadhi sunbe purān ,

Mukhe khāyibe, hāi prabhu, bari guā pān,
Vacana bujhaibe he prabhu rajā darbār.

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(15)

Kohbar Song

Kājijike bāg me cānd hāi Surujvā,
Āre tāhitara Rāmji Bābu dihāsal hain sejiā.

Āre hihāsate khelate geli lādli Sītā pyārī rānī,
Āre lapaki chāil chelā dāhni hai bahīniya,

Āre āju lāḍo yāne na denge
Sohāg ki hai ratiyā

Āre chod chaila chod chailā dāhni hai bahīniyā,
Are phut jāyengē śānkhcuḍī masak parihē bahīniyā
Āre āju sohāg ke ratiyā.

Kāhe ke hai sankhcuḍī kāhe ke hai bahīniyā,
Āre aju sohāg ke ratiyā,
Sohāg ki hai ratiyā,

Āre āju gaurīke yāne na denge,
Sohāg ke hai ratiyā.

Āre sona ke hai saukhcudī sanjāl ke hai bahīniyā
Āre āju lādo ke yane na denge,
Sohag ke hai ratiyā.

Are kim denge sankhcuḍī jodāi denge bahīniyā,
Are aju lādo ke yāne na denge,
Āre āju gaurī ke yāne na denge.

---

(16)

Kohbar Song.

Ghai pichuāre beliya ki gachiyāna,
Age māyi phul phulale caknāriyā (Kacnatiyā)

Seo phulā lodhe gela Bābu Ramji Babu,
Age māyi lodhenge phul kaise kaise lodhenge,

Lodhenge mai to sonā ke dālanavā,
Āge māyi guthenge hār kaise kaise,

Guthenge mai to pātkere doriya
Āge māyi pahnenge har kaise kaise,

Soho har pahine Bābu Rāmjī Bābu,
Age māyi pahin calale sasuraniya
Dhīre calu, dhīre calu, Babu Ramji Bābu
Age mayi najugī hai dulhiniyā,
Āge pātari hai dulhiniya,

Ek ek kos gelā Bābu, doi kos gelā,
Age māyi tuti khasl phul harvā ge māyi,
Pā uyā bharāte to hain kuihā pani harani ?

Age māyi loki na lihaīhe phul harvāge māyi,
Eho hār lokato maiyāre bahiniyā,
Āge māyi our lokto dulhiniyā ge māyi,

Māiyā bahniyā sāmai gharhi me chārihu,
Āge māyi komal hai dulhiniyā,
Āge māyi najugī hai dulhiniyā

---

(17)

Kohbar Song

Kāhvṁahı upajala nārıyal guevā,
Aho kāhvṁahı dṁātrıvo pān re, ālbela,
Ālbela dulhā nınd ghurme haı

Madwā hı upajala nārıyal guevā haı,
Āru kohbara dṁātrıvo pān re, albela,
Ālbela dulhā nınd ghurme haı,

Seho pān khāı gela lādılā Rāmjı Bābu hıṁaı,
Aho rangı gela battīso dṁāt re, ālbela,
Ālbela dulhā nınd ghurme haı

Hansı puche behansı puche sundarī Sītā pyārī rānī haı
prabhu dekhe deho dṁatıyā ko jyotı re, ālbela,
Ālbela dulhā nınd ghurme haı

Kaise hame dekhe devo dṁatıya ke jyotıyā he.
Rānı kohbar sas bahut re, albela,
Ālbela dulhā nınd ghurme haı

Dekhalıṁu maı, dekhalıṁu maı, dṁātıya ke jyotı he prabhu,
Jaısana purnıma nayā cānd re, albela

Hansı puche behansı puche Bābu Rāmjı Babu haın.
Dhānı, dekhe deho mangıya ko jyotı re, albela,
Ālbela dulha nınd ghurme haı

Kaıse hame dekhe devo mangıyā ke jyotı he,
Dekhat hı lāgata sneh re, albela,
Ālbela dulha nınd ghurme haı

Jaısana purnımā naya cand re, ālbela,
Ālbela dulhā nınd ghurme haı

---

(18)

Kohbar Song

Karnı ke bāg mahe acche acche haın kalıyṁā
Tahıtara Rāmjı Bābu dṁāsal haın sejıvā,
Hṁasate khelate golı lādlı Sītā Pyārī Rānī

Lapakı chaıl chelā dāhınıyā haı bahıyṁā,
Chodo chelā, chodo chelā, dāhını haı bahıyṁa,
Aho phutı jāt śankh cudı muruk padehı bahıyṁā.

Śankh cudı phutato he sohāve sonā cudı pahraıb,
Aho, pheru ke gadhāye devo sonā ke kāngnā
Sabhvṁa baıthala tṁohe sasura (Nārāyan Bābu)

Aho tore putṁā Rāmjı todı del haın kāngnā
Kathı ker kāngna haı dulhın kathı ke khelanvā
Aho kathı hı jaḍal acchā eho bhāl kāngnā.

Sona ker kāngana haı sasur rupāke khelanvā,
Aho motıyā jaḍal acchā eho bhāl kāngnā

Hove de dulhın pasaratı hai hātıyā,
Aho pheru ke aısāhı dev sonaker kāngnā.

Sabhviñā baithala tiñohe sasurā (bride's father or grandfather)
Aho, raurā ke mahalvā me bhulāi gele he churiyā.

Khathiker curiyā hai Bābu kathi ke khelanwiña,
Aho kathi ke jadal acche eho bhāl churiyā.

Sonaker churiyā hai sāheb rūpā ker hai muthiyā,
Aho hirvā jadal acchā eho bhāl churiyā

Hove de prāt Bābu pasrati hai hātiya
Aho churiyā oisāhi ke jamāiyā hāth hai daiv

Yava hama hoaib Nārāyan Babu ke betvā
Aho ulti na herab dhani eho bhāl hai churiyā

Yava hama hoaib Kuldip Bābu ke betiyā
Aho kanakhi ne herab Prabhujī, eho bhāl hai kāngnā

APPENDIX B.

Translation of Marriage Songs.

(1)

General Songs.

There is the maiden daughter at the house of Rāja Janakjī,
Sends he letters to house and house,
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
There be the four sons of Rājā Dasaratha and Rām strings the bow.
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
When the procession came to the middle of the street,
The wayfarers and passengers did it surround
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
When Raghunandan reached the outer chambers,
His brother-in-law and father-in law did him encircle.
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
When Raghunandan reached the mandap,
The Pandit was causing the Vedas to be recited;
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
When Raghunandan reached the *kohbar*,
Gathered round him his sisters-in-law (wife's sisters and wives of her brothers),
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants
When Raghunāth reached the inner chambers,
The little wife did him embrace.
Sends the news to Raghunandan, the sandal (of the family),
Comes he fleeting with swift horses and elephants.

---

(2)

General Song.

(Kumarī Gīt).

Song before marriage.

Sits on the window the beautiful Sītā, her eyes bedimmed with tears at the sight of her lord
Lean is Raghunandan and hard (mighty) is the bow (he is to break) [1]
(Thus muses she), "If this groom fail (in the attempt, *viz.*, to break the bow) how is the marriage to take place ?"

---

[1] The reference is to the celebrated story of the breaking of the bow of Hara related in the Rāmāyana at the place of Janaka who promised to give his daughter to wife to the hero who would break it

There did Rām break the bow, shouted the *munis* all the shouts of victory (in applause)
The news did reach Parsúrāma ;
That Rama and Sītā were married

---

(3)

Song before marriage

At the house of Janaka be Sītā kumarī
(maiden virgin) and tho groom, Rāma.
All the *munis* meet and write down all the information in letter which is sent to Avadh (Ayodhyā)
When the Rājā heard the words of the Munis,
Gladdened was his heart and his soul
Filling the plate with gold shall I give thee, mālinī, if a wonderful ship thou makest
The mali wreathes the bridal crown with *campā* flowers,
Casts he a golden crown ,
Mount they the excellent elephant and sound the drums that the king starts on the bridal procession

---

(4)

Tilak Song.

Salutation to the feet of Ganapati ,
Make ready with care the receptacle for *sohāg* (*sindur*, vermilion)
For betokening the blessed life of Rukmini and Krishṇa (the bride and the groom) sprinkle *dahi* (curds) on the door frame ,
For increasing the happiness of Iśvar and Rukmini let some one (*sakhi*) make suitable decorations ,
In honour of the *patra* let some one ride the elephant and scatter gifts therefrom ,
It is the marriage of Rukmini,
Rukma stands at a place with the elephant, ready to give her over to Śiśupala ,
Ah, when Rukmini sent word to Krishna,
A letter arrived at the door that Krishna was coming.

---

(5)

Tilak Song

It is the marriage of Janaka kumārī,
Therefore sing auspicious songs, O sing,
O pray for auspices (*maṅgala*), O youthful girls, and I will reward ye with scarfs (*mukha-añcala*), wearing apparels, gold ornaments, and betel to fill the mouth ,
Shine the dots of vermilion on the head,
As doth shine the sun when peeping in the morning ;
Her moon-face doth beam blooming , sing ravishing tunes
Let the *mādwā* shine with red and yellow ;

(And for your pains) I will reward thee with scarfs, wearing apparels, gold ornaments, and betel to fill the mouth ,
Near the golden post arrange in greater number the golden pitchers, filled to the brim with water, wherein place turmeric, mango sprigs and cover it with the lid ,
Place *pān* on *purhar*, and call the priest ,
Make the square with proper rites, call the priest

---

(6)

Tilak Song

Sing to (in praise of) Ganapati, Ganeś, sing to Iśvar, Gopāl
He[1] is the lord of Sitā, the delighter, not the moon of the world
He is the lord of Sitā, her lord, the delighter of the family of *Raghu*
The lord of Ayodhyā, the lord of Ayodhya, ask and bring him here
Ahe, the delicate person like Raghunath, like him victorious too.
Sit, O Ram, sit securely, bespangled with diamonds red ,
Have we brought the plate filled with pearls, diamonds, jewels—all red (resplendent)
Ahe, bedaubed with vermilion is the black head (with raven hairs) of the *mālinī*
To her is given a female elephant, decked with a string of tinkling bells.
Gladdened as she moves (she says) "Thanks to thee, O, Ramchandra,
O, further demands the *mālinī*,[2] a silken cloth and vermilion more for the head '

---

(7)

Lagan Song

Fix the auspicious time for marriage, fix it for (to secure) long life (*i e* , to the bridal pair)
Besmear the yard with cowdung and paint the square with pearls (in vermilion).
Place golden pitchers, light the lamps,
For it is Raghunāth's marriage, for long life
Bring and seat him, the son of Dasrathjī,
Fill (the plate) with heaps of pearls ,
Bring and seat the daughter of Janakjī ,
Paint full the *māngiyā* with vermilion ,
For long life in this marriage
(They) brought and seated the beloved Babu,
Filled (they the plate) with heaps of pearls ,
They brought and seated the beloved girl,
Painted full the *māngiyā* with vermilion
For long life in this marriage

---

[1] The bridegroom

[2] She says that she demands

(8)

The marriage wreath for the bridegroom

Proceeding in quest did the female garland-maker enter the city.
"I say in what Rājā's house is there wedding ?
I shall weave wreath to resemble that of *moti* (pearls)"
"Wouldst thou string ? Come, fair *malini* mine,
Here I see the high gate, O malini,
The elephants do fight, come the horses,
O, horses and elephants do come"
"I shall weave wreath to resemble that of pearl."
"Wouldst thou string ? Come fair *malin* mine"
"Haste thee *malin*, the groom is at the door
O, greatly do we value him,"
"I shall weave wreath to resemble that of pearls"
Many *lakhs* does the malin set the price on the wreath
O, nine (lakhs) more does the grand-father give,
And, O, nine (lakhs) more does the uncle give

---

(9)

The bridal crown of the bridegroom.

Wearing golden sandals stands the beloved Babu,
And calls loudly, O *māli*, O *mālini*, O mother [1]
The *māli* was sleeping in the orchard,
And the *mālinī* in the flower garden
The *mālin* rises and awakens the *māli*,
"Stands at the door the beloved Bābu, O mother"
"Otherdays, O rustic, you never trod this lane,
How is it that today you stand at the door ?
What has happened to you, fool, is it *gad gadpuā* ? [2]
Or is it the *mudnā* [3] of your nephew ?"
"O malinya, it is not *gad gadpuā* happened to me,
Nor is it the *mudnā* of my nephew,
At my house, O malinyā, has *lagan* begun already,
And wreathe me the bridal crown (gaj mor)"
"You cry on, cry on, *gaj gaj*, O beloved,
But of what other kind can bridal crown be ?"
On the eight corners did the *mālin* weave dangling frills,
And in the middle did she inlay a moon and a sun, O mother,
Wearing the crown when came out Ramji Babu,
The members of the household were greatly charmed, O mother
The wayfarers, O beloved, will be pleased on the way ;
And the female drawers of water at the well,
And at the *madwā* will be pleased the father of the bride,
And at the foot of the *vedi*, the mother of the bride, O mother,
And at the *kohbar* will be pleased the sisters of the bride and wives of the bride's brothers
And the bride herself at the bridal couch
Blessed is your mother, O beloved, blessed is your father,
In whose womb you are born, O mother

---

[1] O mother,—the refrain [2] Have you become a visionary ?

[3] Cuḍā karana (चूड़ाकरण) ceremony.

When, O mother, I was young (Lit twelve years of age)
I sported with *pailani*,[1] O mother,
Spinning it round with my feet,
When I ate a little, rubbed some (the remains) with my feet,
and pushed the rest away with my feet

---

(10)

Song addressed to Ganpatiji—sung at the time of applying uvatana.

Worship we Śrī Ganapatī, Hari Hari,
There decked with the string of treasure looks beautiful the *mandapa*,
(here) let us apply *uvatana*,—Hari!
There smear we the yard with cow dung,
(here) let us apply *uvatana*,—Hari!
There prepare we the square and paint on it the pearls[2] (in vermilion)
(here) let us apply *uvatana*, Hari!
Let us bring the golden pitcher and place it as *purhat*[3]
(here) let us apply *uvatana* Hari!
There fill we the jewelled lamps (*i e*, with oil),
(here) let us apply *uvatana*, Hari!
For seat let us bring the golden lion seat—
(here) let us apply *uvatana*, Hari!
There bring we Radha and Krishna and seat them,
(here) let us apply *uvatana*, Hari!
Of barley and wheat let us apply *uvatana*
(here) let us apply *uvatana*, Hari!
There let us mix oil of white mustard,
(here) let us apply *uvatana*, Hari!
Fill we the golden plate with vermilion,
(here) let us apply *uvatana*, Hari!
There five *sohāgin*[4] sing *mangal*[5] songs,
(here) let us apply *uvatana*, Hari!
Lord Tulsi dasa sings this *mangal* song,
(here) let us apply *uvatana*, Hari!
There taking the mirror see their face,
(here) let us apply *uvatana*, Hari!

---

(11)

Mandapa Song.

Shines the *mandapa* (with the presence of) Rāma and Jānakī,
On the square (*viz*, the *mandapa*) sit the *samdhi* and the *samadhin*[6]

---

[1] A small measure of canework or of wood, in which children eat the luncheon

[2] Pearls supposed to be got from the head of the elephant

[3] The pitcher is technically so called

[4] Ladies whose husbands are alive

[5] Auspicious songs.

[6] The father and the mother of the bridegroom in their relation to the father and the mother of the bride, and *vice versa*, are called *samdhi* and *samdhin* respectively

Bustle and hubbub run high at the house of Janak
The Rājā (Dasarath) leads in the *bārāt* in pompous array,
to where the nectar of the son (the son who is as dear as nectar) is
The *bārāt* and *sarāt*[1] now join, now separate in whirls,
Shines the *mandap* in their union, of the *keśarī* colour (yellow) are their turbans and *jāmās*, in their ear-lobes are stuck the pearls,
Dasarath and Janak converse (lit solace) mutually, "The connection is quite agreeable to both of us"
On the head of Sītā Rāmji applies *sindur*
Thus decked looks she more charming,
Strike the chords (lit let there be music), go forth the songs in praise of Janaka, ever cry, the shouts of victory (*jai*) in nectared tunes
Joyous are Rāma and Sītā, let from the spheres of gods shower down the flowers

---

(12)

Benediction at the time of marriage.

Invocation to Hari (at the time of) application of vermilion,
To Gajadhara of Gayā, and Mādhava of Prayāg (and) to Hara and his consort at Baijnath, let us bring the pair.
O Rānī,[2] be your *ehivāt*[3] for *yugas*[4] and *yugas*

O Rani for *yugas* and *yugas*
Great penance[5] hast thou done O Rānī, O Gaura rani[6]
And hast got Bholānāth for thy husband

O Rani, be your *ehivāt* for *yugas* and *yugas*
O Rānī for *yugas* and *yugas*

Live Īśvara Mahādeva—*ehivāt* of Gaura-rānī,
O Rānī be your *ehivāt* for *yugas* and *yugas*
O Rani for *yugas* and *yugas*

Great penance hast thou done O Rānī, Rādhā rani, *Pyārī* (dear)
And hast got Krishna for thy husband.

O Rānī, be your *ehivāt* for *yugas* and *yugas*;
O Rani for *yugas* and *yugas*

Live for *yugas* Śrī Krishnacandraji,
Ehivāt of Rani Radhā pyarī

O Rānī, be your *ehivāt* for *yugas* and *yugas*,
O Rānī for *yugas* and *yugas*.

---

[1] The bride's party who receive the bridegroom's party, the idea is that they meet and go round so that there are ever-forming, ever breaking groups of the meeting

[2] The bride

[3] The married state when husband is alive, lit —beest thou ever united with thy husband

[4] Æons

[5] The reference is to the great *tapas* resorted to by Gaurī, the daughter of Himalayas for getting for her husband Śiva (see Kalidas, *Kumar*-canto V)

[6] Fair complexioned.

(13)

Cumānā[1] *Song*

Shines the wreath on Rāmjī shines a *tilak*[2] on his forehead,
Let us come, O *Sakhis*,[3] let us come and touch Rāma ,

Shines gold (some small golden earring),
On the ear-lobe of Rāmjī ,

Shines a *tilak* on his forehead
Let us come, O *Sakhis*, let us touch Rāma.

Let us come, O *Sakhis*, let us touch Sīyajī (Sītajī)
Shines the crown on the head of Rāma ,

On the neck of Sīyā, garland of wild flowers,
Let us come, O *Sakhis* let us touch Sīyā

---

(14)

Kohbar Song

Five betel nuts and twenty-five betel leaves ,
Sits Rāmjī Babu on the bed stead
Babu[4] stands with betel and betel leaves

Babu stands with betel and betel leaves
On the couch sits Sīta Rām dear ,
Seeing the face (the bride wonders)

' What a (beautiful) face, O Lord, has the carver carved,
What a (beautiful) face, O Lord, has the goldsmith made "[5]

" Undiscerning art thou, O Rām undiscerning and without knowledge,
O Dhani[6] no man (no human face) does the goldsmith make "

Walking, walking in the city says the kotwal,
" O Rāmjī Babu, thou hast been summoned to the court of the Rājā "

" My mind is in suspense, my mind is sad,
Leaving such a beautiful girl I won't go to the court "[7]

"[8] If you go to court, you will chew betel nuts and betel,
Mounting and seating on the *chabutrā*[9] you will hear Purāna discourse ,

You will chew (in your mouth) excellent betel and betel nuts
(Then when the purpose of your summon is told you) you may explain your words (the matter) before the court "

---

[1] Touching the bride or the bridegroom with *dub*, paddy, and turmeric (see *ante*).

[2] *Tilak* mark of sandal wood paste generally worn by persons, between the eyebrows, stretching to the hairs ; here an ornamental decoration of the groom

[3] Female friends. [4] He stands ; the idea is of service

[5] In her infatuation

[6] Address for the bride , generally a female lover is thus addressed.

[7] Divān—the couch ; the throne, and therefore the court

[8] Then his wife urges him to go. [9] Platform.

(15)

Kohbar Song.

In the garden of Kājīji rise the moon and the sun,
Āre, underneath Rāmjī Babu has spread the couch,
Āre, there went laughing and playing the beloved Sītā Rānī dear,

Āre, on a sudden the beautiful boy caught hold of her right arm;
"O dear, I won't let thee go to-night,
The night of love is to night"

"*Āre*, let go, lad, let go lad, right arm mine,
Āre, will split my chank bracelet, and be sprained my arm
Āre, the night of love is to-night"

"What is thy chank bracelet made of and of what thy arm?
Āre, to-night is the night of love,
The night of love
Āre, to night I won't let thee fair one, go
The night of love is to-night"

"*Āre*, my *śankheudi* is made of gold, my arm a compound of bone and muscles"

"O dear, I won't let thee go to-night,
To-night is the night of love
Āre, I shall buy thee *śankheudi*, and get thy (broken) arm joined
Āre I won't let the dear one go, to-night,
Āre, I won't let the fair one go to night"

---

(16)

Kohbar Songs.

Behind the house is the *veli* plant,
There fine flowers have blossomed,

Those flowers hath Rāmji Babu gone to pluck,
O mother, how should I pluck the flowers, how should I (pluck)?

I shall gather the flowers in golden baskets,
O mother, how should I wreathe the wreath?

Let Ramji Babu wear the garland,
I shall wreathe it, indeed, with the string of silk

O mother, how shall I wear the garland?
O mother wearing (this) I go to father-in-law's house.
"O Ramji Babu, walk slowly walk slowly"

"O mother, the bride is tender,
O, slender is the bride"

He walked one *kos*, and one *kos* and two,
"O mother the flower garland falls broken"

The females are drawing water from the well
O mother, but they do not catch up the flowers (before they fall to the ground)

"This wreath, thy mother and sister will catch up,
O mother, and will catch up thy bride "[1]

"Mother and sister have I left behind at home, O fair ones,
O mother, and my bride is tender "

---

(17)

Kohbar Song

"Where have sprung coconut and betel nut ?
O whence has sprung the betel creeper with the stalk, O beautiful, spruce (Rāni) !
The beautiful bridegroom is dosing

From the *marwa* have sprung the coconut and the betel nut,
Āre, from the *kohbar* has sprung the stalked betel, O, *ālbela*, (dear),
The beautiful bridegroom is dosing

That betel has Ramji Babu eaten,
His thirty two teeth have gone coloured, O *ālbela*,
The beautiful bridegroom is dosing

Asks laughing, asks laughing more, the beautiful dear Sītā rānī,
"O Lord, let me see the sheen of thy teeth ,"
The beautiful bridegroom is dosing

"How should I let thee see the sheen of my teeth, *he* ?
O Rani, in the *kohbar*, are many mother in-laws, *ālbela*."
The beautiful bridegroom is dosing

"O Lord, have I seen, have I seen the sheen of thy teeth beautiful
As is the sheen of the beautiful full moon."

Asks laughing, asks more laughing, Rāmji Babu,
'Let me, dear, see the sheen of thy *mangiyā*,[2] *ālbela* '
The beautiful bridegroom is dosing

"How should I let thee see the sheen of my *mangiyā* ?
As thou seest it, will spring thy love "
The beautiful bridegroom is dosing

"The sheen of thy parted hair, have I seen, have I seen, Rani,
As is the sheen of the beautiful full moon '
The beautiful bridegroom is dosing

---

(18)

Kohbar Song.

Numberless are buds beautiful in the garden of *Karni* ,
Underneath has spread Rāmji Babu his bed,
There goes laughing and playing the beautiful Sītā dear,
Of a sudden catches the beautiful lad her right arm.

---

[1] This is the abusive retort to the bridegroom made by the female water drawers at the well

[2] The line on the head showing the parting of the hair

"Let go, lad, let go, lad, right arm mine;
'Oh, my chank bracelet will break, my arm will get sprained"

'If the chank bracelet breaks, my dear,
I will give thee gold bracelet to wear,
O, again, I will have thee made golden bracelet" (*kankana*)

"In the *sabhā* (assembly) you are sitting, Nārāyan Babu, (the father-in-law),
And your son Rāmji Babu has broken my bracelet."

"Of what stuff is thy *kāṅgna* made, O bride, and of what stuff thy toys?
O with what is embroidered thy good *kāngnā*?"

"Of gold is good kāngnā mine, O father-in-law, and of silver my toys.
And (pearls) form the embroidery of good *kāngnā* mine"

"Let dawn break, O bride and the markets open,
O, again shall I give thee *kāngna* exactly similar'

'In the assembly sit you, O father-in-law,
In your *mahal* (house) is lost my knife"

"Of what stuff is made your knife, and of what your toys'
And what was set in your knife?"

'Of gold was my knife, O *sāheb*, and of silver the handle,
And diamonds were set in my good knife"

"Let the dawn break, O Babu, let the market open,
And exactly similar knife I will give in the hands of the bridegroom"

'If I am the son of Nārayan Babu,
I will not turn my looks on thee, so priceless was my knife (now lost)"

(Retorts she) "If I am the daughter of Kuldip Babu,
I will not so much as favour thee with a wink (look from the corner of the eye)
So priceless was my bracelet."

A Note on a Double Chick Embryo.[1]

By JNANENDRA LAL BHADURI

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During my embryological class work in this College in the year 1926, I have come across a case of two clearly formed embryos developed within the limits of a single blastoderm It was the only abnormal embryo found in a batch of eggs (20 in number), which were put together in the incubator All the others exhibited normal development, the duplicity of the embryo cannot, therefore, be considered as the result of any faulty incubation. A large number of cases of partial or complete duplicity in the development of hen's eggs have already been reported and described, but this case is particularly interesting by reason of its nearly symmetrical orientation and its particular stage of development I, therefore take this opportunity of putting this further instance on record

The egg was incubated for nearly forty hours The blastoderm with the two embryos was removed in tepid normal saline solution and was fixed in Bouin's fluid The specimen was later stained with Borax Carmine, differentiated in Acid Alcohol, dehydrated, cleared in Clove Oil and mounted in Canada Balsam The figure 2 was then drawn with the Camera Lucida, and a Micro-photograph was taken

DESCRIPTION OF THE SPECIMEN

The area pellucida was circular and regular, and the two embryos were so placed that their anterior cephalic ends touched each other in the middle line of the area while their caudal ends diverged towards opposite ends of the area (Fig 1). The posterior regions of the two bodies were similar to each other in possessing a well formed neural canal (Fig. 2, N.C), a notochord (Fig 2, Ntc), and a series of mesoblastic somites (Fig 2, M S), but the number of the segments differed in the two cases,—the left hand embryo possessed a double row of sixteen somites while the right showed only eighteen The neural canal was in each case open and the primitive streak

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[1] Read before the Fifteenth Session of the Indian Science Congress held at Calcutta, 1928

visible (Fig 1) Each anterior end showed normal features in the swelling out of the Central Nervous System to form the fore- mid-, and hind-brains (Fig 2, F B, M B, and H.B.). There were well-formed optic vesicles (Fig 2, O.V.) growing out of the fore-brains but the auditory pits, which are generally seen at this stage, could not easily be distinguished The two chicks had separate hearts (Fig 2, Ht) but the vessels opening into them could not be followed A single amniotic fold (Fig 2, Am) covered the head regions of both the embryos.

The above description shows that no organic fusion of the two embryos had occurred, though very close approximation of the anterior cranial portions had taken place This leads one to believe that these two embryos were independent of

Fig. 1. Microphotograph of the entire Double Chick Embryo × 6

each other In this respect this instance approaches the cases described by Spencer (12), Kaestner (7*a*), and Bruckhardt (3); other instances have been reported where the double embryos, though independently formed, are oriented differently, as for example the cases reported by O'Donoghue (10) and others Further, the conditions revealed in the present instance may be called autositic, a term used by Saint Hilaire (13) to denote those conditions in which the two embryos are practically equally developed

There are numerous teratological theories regarding the malformations of chick or other embryos naturally and artificially produced; but it has been admitted by many that such double monstrosity has arisen from a single ovum by fission,

as opposed to the rival theory of original duplicity with subsequent fusion. The present case would appear to come under the former category. As to the theories that have been put forward to account for the splitting of the originally single germinal area the irritation theory of Clealand (5) seems the more probable; but in the absence of sufficient data and especially in view of the fact that the other eggs, incubated along with it and opened on the same day, showed normal development the exact nature of the irritation responsible for the formation of the double embryo in the present case cannot be indicated

I am indebted to Lt -Col R B Seymour Sewell, I M S, Director of the Zoological Survey of India, for kindly going through the manuscript

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Fig 2 Anterior portion of the Double Chick Embryo (Camera Lucida drawing) x 30

Am ..	Amnion	M B .	Mid brain
F B .	Fore brain.	M S .	Mesoblastic somites.
H B	Hind brain	N C ..	Neural canal
Ht	Heart	Ntc	Notochord

O V . . Optic vesicle

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Fig 2 Anterior portion of the Double Chick Embryo (Camera Lucida drawing) × 30

Am . . Amnion
F B . Fore brain
H B Hind brain
Ht . Heart
M B ... Mid brain
M S .. . Mesoblastic somites
N C .. . Neural canal
Ntc. .... Notochord.
O V .. .. Optic vesicle

ARTICLE No. 37

Bibliography of Meteorological Papers in the Publications of the Asiatic Society of Bengal.

1788-1928.

BY V V SOHONI

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FOREWORD.

The following pages contain a bibliography of papers of meteorological interest in the publications of the Asiatic Society of Bengal The publications that were consulted in compiling the lists are—

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III	Journal ..	1832–1904
IV	Proceedings ..	1865–1904
V	Journal and Proceedings . ..	1905 onwards
VI	Memoirs	1905 onwards
VII	Proceedings of the Indian Science Congress	1914 onwards.

2 The papers seem to reflect, in a way the history of meteorology in India In the pioneer days, until 1875, one finds an abundance of papers on meteorological subjects pertaining to various parts of India and adjacent countries Piddington's historic series of Memoirs on the Law of Storms forms one of the important contributions of these early days After the constitution of the India Meteorological Department we find a number of papers from the authoritative pen of Mr H F Blanford the first Director-General of Observatories and for some time an Honorary Secretary of the Asiatic Society With the transference of the headquarters of the Meteorological Department from Calcutta to Simla, the output in the Society's publications seems to languish, one of the main reasons probably being that the Department commenced to have its own publications

3 A new era, however commenced when in 1914 the Indian Science Congress started under the auspices of the Asiatic Society, and since this time one finds again an efflorescence of papers, contributed now to the Indian Science Congress.

4 The first part of this bibliography contains a list of papers arranged in series corresponding to the different publications In this list the full title of each paper, and author (wherever known) are given with a reference to the original publication in which it appeared Also a serial number is assigned to each paper. The parts following comprise an author index, a subject index and a geographical index, containing references to the serial numbers in the first comprehensive list In many cases spellings, particularly of place names, are not according to current usage, but these have been retained exactly as in the original

V V. Soboni.

The Observatory,
Alipore. Calcutta.
The 4th June, 1928

List of Meteorological Papers in the Publications of the Asiatic Society of Bengal.

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A treatise on Barometers

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Observations respecting the remarkable effects of Sol-Lunar Influence in the Fevers of India, with the Scheme of an Astronomical Ephemeris for the purposes of Medicine and Meteorology

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Description of a Pluviameter and an Evaporometer constructed at Benares

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12. I, 1829, p 29 — **Dulong,** M M and **Petit.**
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16. I, 1829, p 45. — D
On Hygrometry.

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On the Calculation of Heights, determined by Barometrical Measurements

19. I, 1829, p 99 — Q
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20. I, 1829, p. 113. — J A H.
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118. VI Pt II, 1837 p 696 **Lohar,** Chhedi (a smith in the employ of Captain **Robinson,** late Commanding the Escort of the Resident in Nipal)
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Social organisation of the Sātakarṇis and Suṅgas.

By K. P CHATTOPADHYAYA

1. The dynastic lists of the Andhra kings who ousted and replaced the Kanva rulers (and whatever was left of the Sunga kings) varies in the Purānas[1] The three early Purānas, Matsya, Vāyu and Brahmānda while agreeing in many particulars differ on some very important points Thus the Vāyu and the Brahmānda give a much shorter list, the former naming 17-19 kings, (one MSS only, the so-called "e" Vāyu of Pargiter naming 25), the latter seventeen The Matsya on the other hand name these as also numerous other kings, five MSS actually naming thirty kings The summary at the end of this dynastic list in Vāyu and Brahmānda say that there were thirty kings who ruled for 411 and 456 years respectively (P33 N33) With this the Matsya agrees in so far as the total regnal period is said to be 460 years The total number of kings is said to be ekonavimsati but this is probably a misreading of ekonatrimśati owing to a possible confusion of t and v in Prakrit (the original language of composition) in Kharosthi (Pxxiii 39 and xxvi N3). Clear instances of this misreading are found in the account of this same dynasty in the regnal year of Yajñaśrī in Vāyu and Brahmānda and in the passage relating to astronomical particulars (P57 N4)

The list of kings in the Matsya Purāna (full 30) arranged in the order about which all the Purānas agree (except a few MSS.), is as follows :—

	Name	Regnal period.		Name	Regnal period
1	Simuka	23	11	Skandasvāti	7
2	Krsna	10[2]	12	Mrgendra	3
3	Śrī-Śātakarni	10	13	Kuntala	8
4	Pūrnotsanga	18	14	Svātikarna (correcting an obvious misreading)	1
5	Skandhastambhi	18			
6	Śātakarni	56			
7	Lambodara	18	15	Pulomāvi	36
8	Āpilaka	12	16.	Aristakarna	25
9.	Meghasvāti	18	17.	Hāla	5
10	Svāti	18	18	Mantalaka	5

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[1] The Pauranic account is taken from Pargiter's comparative "Purāna Text of the Dynasties of the Kali age" (1913), except where otherwise indicated Reference to Pargiter's book will in future be given like P17 N3 (page 17, note 3).

[2] Pargiter, ibid Introduction, §40 for misreading of abdān daśa as astādaśa

	Name	Regnal period		Name	Regnal period
19	Purīndrasena	21	25.	Śivaśrī Pulomā	7
20	Sundara Śātakarṇi	1	26	Śivaskandha	3[1]
21	Cakora	½ year	27.	Yajñaśrī	29
22	Śivasvāti	28	28	Vijaya	6
23.	Gautamīputra	21	29	Candaśrī	10
24	Pulomā	28	30	Pulomāvi	7

The Vāyu usually names 1-3, 6, 8, 15-23, 27-30[2] A number of manuscripts however leave out No 21 The Brahmānda, names 1-3, 6, 8, 15-20, 22-23, 27-30

The less accurate and later Purānas, Visnu and Bhāgavata give the following lists :—

Visnu	..	.. 1-4, 6-9. 15-30
Bhāgavata	..	.. 1-4 7-9, 15-20

The regnal periods given, also differ from Matsya in the case of 3, 15, 17, 27 and 29 in the Vāyu and Brahmānda Purānas In the case of No 3, Vāyu and Brahmānda merely state that the son of Krsna was a great king and pass on to No 6. The regnal periods of the kings numbered 15, 17, and 29 are given as 24, 1, and 3 respectively, in place of 36, 5, and 10 of the Matsya[3]

From internal evidence, the Matsya appears to have been taken from the Bhavisya Purāna as it existed about the middle of the third century A.C The Bhavisya account was later extended to the beginning of the Gupta rule and also revised to some extent This version seems to have been borrowed by the Vāyu and Brahmānda The other Purānas seem to have incorporated the dynastic lists later and are not reliable except in so far as they seem to corroborate the above three Purānas (P xxvii 44–51)

2 It is evident that all three Purānas—Matsya, Vāyu and Brahmānda represent tradition current at the period immediately following the time of the Andhras The discrepancies in the revised texts are however so great that it cannot be due to any oversight or slip on the part of the editors Unless we are prepared to reject the whole Pauranic account as utterly untrustworthy—an easy solution of a difficult problem—we have to examine the Purānas themselves to see if they throw any light on this discrepancy

Let us first of all examine the accounts common to all three Purānas The kings named in the later text are all found in the earlier text The total of the number of kings stated

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[1] P 42, Note 7, and Appendix I, § iii That the reading should have "tayo" (=trayah) appears to be almost certain as otherwise "samah" would have no meaning

[2] Although on page 36 Pargiter states that Vāyu mentions 6-8, note 43 of page 39, makes it clear that this is not the fact and that only 6 and 8 are given

[3] See page 6 for Nos 2 3, and 27

in the revised text is the same as actually found in the complete Matsya list[1] Also the total of the regnal periods of the Vayu agrees closely with the total of the reigns of the kings named in the Purāna plus the regnal period of kings occurring only in the Matsya (neglecting the corrupt text of the e Vāyu MSS) At the same time, the revised texts expunge no less than 12 (Vāyu)—13 (Brahmānda) names leaving 18-17 kings with a total rule of 262½ to 262 years. The inference is that the later editors admitted that there were really thirty kings as named in the Matsya, with a total rule of over four centuries, but at the same time a large number of the kings did not have any place in the dynastic succession recorded

As some of the kings mentioned in the Matsya stand in the relation of son to the kings shown in the Vāyu and Brahmānda texts, it is evident that the kings excluded from the revised version were not of another dynasty constituting successors or predecessors, as a whole, to the royal line given in the later text The internal evidence of the two versions therefore indicate that we are dealing with two sets of kings, only one of whom was however considered by the revising authorities to possess the privilege of having the names preserved in the Purānas

The question arises as to why, in that case, an extra set of kings were incorporated in the earlier account This involves the question as to why certain lists are preserved in the Purānas in so much detail, others obtaining only a bare mention of totals The principal lists (showing detail) given in the Purānas, themselves indicate the reason A number of kings of the Paurava, Iksaku, Barhadratha, and Śaisunāga lines are mentioned as having ruled the earth (P4-22) In the case of the two earlier dynasties, the accounts end in each case with the statement "In this connection the genealogical verse was sung by ancient brahmans, etc." (P66, 67 Text P8, 12). The later dynasties of Maurya, Śuṅga and Andhra kings are known to have been sovereign powers—and in the case of the two latter dynasties, some of the members are known to have performed the Rājasūya ceremony with success The principal dynastic lists thus appear to have been drawn up showing the genealogy and succession of sovereign kings and recited on their ceremonial investiture as lords paramount

We are therefore led to conclude that the kings retained in the revised list satisfied the above conditions while those excluded, did not. The fact that the names expunged are included in the earlier version, however, points to the fact that one at least of the three conditions—genealogical con-

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[1] The triṁśati of Brahmāṇda cannot be taken as misreading for viṁśati as the number is below 20 definitely

nection, succession and paramount position must have been satisfied by these kings, in common with the rulers retained If it were the condition of sovereignty, then they[1] would have found a place in the revised text separately besides the kings shown in that version. Apart from the above condition, the contemporary character of the Q rulers with the R rulers stand in the way of the above common factor The same factor rules out the possibility of succession as the common factor Further as the Q rulers are strewn among the whole list in the Matsya along with R rulers, the lack of paramount power on their part would not have led to their wholesale exclusion from the Purāṇas—even from a summary list For the whole Paurāṇic account, although written from the point of view of the Magadha kingdoms (Px. 13) mentions the contemporary Pauravas and Ikṣākus, both of which lines (according to the Purāṇas) produced paramount kings along with the Bārhadrathas.

The third and remaining factor—of genealogical connection would seem at first sight to be equally incompatible For, to the Brahman compilers of the Purāṇas, genealogy meant descent from father to son and so on, in the male line. Hence, as the rulers were all males, succession would appear also to be patrilineal and to coincide with descent Therefore the exclusion of the former as a common factor would appear to exclude the latter as the possible link. This is not however the case Ethnologists are familiar with the fact that descent or genealogical relationship may be counted through the mother as well as the father. Succession (transmission of rank or other similar social distinction) also may follow either of the lines and the two, descent and succession do not even always go together [2]

3 The exclusion of royal succession as the common factor therefore does not rule out genealogical connection as the possible connecting bond Before however we can conclude that genealogical connection is indeed the determining factor, we have to consider an alternative view suggested by Sir R G

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[1] The Rulers whose names were expunged in the later text will be referred to as Q Rulers for convenience The others will be shown as R Rulers

[2] The best example of descent and succession following different lines are found in Melanesia W H. R Rivers, *History of Melanesian Society*, Vol I

Codrington, "*The Melanesians, their anthropology and folklore* "

I have considered it necessary to draw the attention to this point in detail to point out that although the Purāṇas mean by genealogy, patrilineal descent, the actual mode current among Śātakarṇis may have been different Further, even if the actual mode of descent were patrilineal, the succession might follow a different rule. The Melanesian examples referred to illustrate patrilineal succession combined with matrilineal descent

Bhandarkar.[1] According to him, the smaller number of kings with a total of 272½ (?) years, given in the Vāyu Purāna refers to the main dynasty, with the royal seat at Dhanakakata. The additional names and periods found in the Matsya are referred to younger princes of the family who ruled at different places but more often at Paithan than elsewhere "When the throne became vacant, the Paithan princes succeeded. But some probably died before their elders and never became kings of Dhanakakata" (RB 33). This suggestion of Sir R G. Bhandarkar is based on—

(1) The discrepancy between the Matsya and Vāyu accounts in the number of kings as also regnal periods
(2) The existence of more than one line of Śatakarni kings ruling in different parts of the peninsula
(3) The reference in Ptolemy's geography[2] to Pulumāvi as ruler of Paithan and to one Baleokuros ruler at Hippokura in the south—coupled with the finds of the coins of Gotamīputra Vilivāyakura and Vāsisthīputra Vilivāyakura at Kolhapur [3]
(4) Gotamīputra ruled at Dhanakakata while his son Pulumāvi ruled at Paithan

Regarding the third point, discussion is not necessary here as the statements in Ptolemy nor the coin legends show that the Vilivāyakuras were Sātakarnis of the main line These will be considered in their proper place

The second and fourth arguments in support of Sir R G Bhandarkar's hypothesis are based on inscriptions [4] But the rulers mentioned in the Banavāsi inscriptions cannot be shown to have been contemporary with so called Paithan rulers and those of the main line or to have found a place in the Matsya list The statement that Pulamāvi ruled at one place and Gotamīputra at another[5] does not prove anything beyond the fact that the father and the son ruled contemporaneously as kings at different places.

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[1] Sir R G Bhandarkar, "*Early history of the Deccan*" Bombay, 1895 References to this work will in future be given as RB 36 (Sir R G Bhandarkar, *ibid*, p 36)

[2] J W McCrindle, *Ancient India as described by Ptolemy*, 1885 The actual mention is of Baithana as the royal seat of Siro Polemaios and of Hippokura as the royal seat of Baleokuros (p 175)

[3] *Journal of the Bombay branch of the Royal Asiatic Society*, Vol XIII p 305, Vol. XIV, pp 153 54

E J Rapson, *Catalogue of the coins of the Andhra dynasty, etc.* Kolhapur Nos 13—21, 47—51, etc.

In future Rapson's catalogue will be referred to as BMC. No, etc

[4] *Epigraphica Indica*, Vol X, Lüders' list No 1021 and 1195 (Kānheri Buddhist cave inscription and Malavalli pillar inscription)

[5] On the strength of the interpretation given by him to the phrases in which Dhanakakata and Navanara occur in the inscriptions numbered 1125 and 1124 respectively in Luders' list

A very strong piece of evidence against Sir R. G. Bhandarkar's views is based on the law of chances or probability. As any Life Insurance Company will certify, and as common experience bears out, the chances of an adult son surviving his father are on an average much greater than the reverse (of the father surviving his grown up son). On Sir R. G. Bhandarkar's view, the 17 kings in the Vayu list would represent princes who outlived their fathers, after having ruled earlier (certainly not before attaining adult age) at Paithan. The thirteen names left out and found only in the Matsya stand for princes who did not survive the fathers but merely ruled at Paithan.

The above figures mean that on Sir R. G. Bhandarkar's view it is necessary that only in four cases out of seven could an adult prince—with an average rule of 13 years at Paiṭhan—survive his father (the average rule of the main line being 16 years).

At first sight it might appear that the discrepancies in the actual regnal periods of certain kings (*e.g.* Nos. 2, 3, 15, 17, 27, 29) in the two versions are in favour of Sir R. G. Bhandarkar's view. For, the Matsya list might be held as giving the regnal periods at Paithan plus those at the principal seat. The corrections in the Vāyu would then stand for deductions for the rule at Paithan, to get the balance representing the rule at the chief seat of Government. But the regnal periods of every king common to the two versions, should on this view, differ in the two lists. Actually however, only three[1] out of seventeen really show such discrepancy. The corrections in the later version do not therefore require an assumption of the kind made by Sir R. G. Bhandarkar. They are in fact against it inasmuch as the careful revision of the text has resulted only in three corrections—which are within the bounds of mistake in the earlier text—instead of a wholesale revision expected on Sir R. G. Bhandarkar's view (unless we treat the regnal periods given in the Matsya as excluding Paithan rule which would however render the inclusion of the Paithan rulers quite meaningless).

Another piece of evidence of very great weight against the hypothesis of Sir R. G. Bhandarkar is that the name of Pulumāvi, son of the famous Gotamīputra does not occur in the Vāyu and Brahmānda lists. Pulumāvi is known to have ruled at Paithan[2] and was lord of Dakṣiṇāpatha and

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[1] Although the number is apparently six, we cannot class Nos. 2, 3, and 27 with the rest as in the case of 2 and 27 the regnal periods appear to differ owing to obvious misreadings. No. 3 is mentioned as a great king without any regnal period,—which is different from a discrepancy in actual periods.

[2] The reference to Paithan as the royal seat of Pulumāvi

outlived his father[1] Sir R. G Bhandarkar has actually assigned 4 years to Pulumāvi as the period of his rule at the principal seat of the dynasty (RB 34) As Pulumāvi's name was known in distant Egypt, the nonoccurrence of his name in the Vāyu and Brahmānda lists cannot be due to ignorance or carelessness of editors who had the earlier version before them (as the concluding verses show). We are therefore compelled to conclude that Pulumāvi did not succeed his father Gotamiputra although he outlived the latter and was lord of Dakṣiṇāpatha at that time

4 We may now return to the possibility, noted previously that the connection between the two sets of kings was genealogical, but that the succession did not coincide with the mode of descent. It is necessary, for this purpose to examine the available evidence to determine the actual mode of succession as well as the genealogical relationship recorded, bearing in mind that the two are different things and that the latter was probably patrilineal, this being the meaning attached to genealogy by Brahmanic writers of the Puranas

If the Vāyu and Brahmanda lists are consulted for the successor of Gotamiputra, the father of Pulumāvi we find the name of Yajñaśrī On a reference to inscriptions and coins it is found that this king, like the father of Pulumavi, is styled Gotamiputra[2] Being a Gotamiputra, Yajñaśrī may of course be a younger brother of his predecessor But the Puranas mention no such relationship—although in the case of an early king like Kṛṣṇa, the second of the line, this relationship to Simuka is noted As Yajñaśrī was a powerful sovereign[3] and part of the compilation of the dynastic list seems to have begun in his time[4] indifference or ignorance have to be ruled out and we have to conclude that the relationship to Pulumāvi's father was not of a brother To elucidate the nature of the succession we have to look for a very near relative (close enough to displace a son) other than a younger brother, and who can yet be a Gotamiputra

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in Ptolemy's work certainly establishes this, although it may not give his date

[1] Lüders' list Nos 1123 and 1124

See Appendix A, for a full discussion of this series of inscriptions, of Pulumavi, his father, his mother and his father's mother

[2] Inscriptions Luders' list Nos 987 and 1024 (Kānheri) 1146 (Nāsik), 1340 (China)

Coins Sopara coin of Yajñaśrī vide *J B B R.A S*, Vol XV, Andhradeśa, BMC Nos 135-38, 40, 149, 154, 157, 161, Chanda district, BMC Nos 165-168, 170

[3] The wide distribution of the coins and the inscription leave no doubt of the extent of his kingdom

[4] The Bhaviṣya Purāna was much older and some compilation may have been made at the time of the Paurava, Aikṣāku and Bārhadratha kings See Pargiter, XXVII, 49, and note 1 re 11.

For this purpose it is necessary to ascertain the exact significance of the term Gotamīputra from contemporary documents of the same area as was ruled over by these kings.[1]

In the Nasik inscription of the 19th year of Pulumāvi, the mother of Gotamīputra is termed Gotamī Bālasiri[2] Gotamī is therefore part of the name of the mother of the royal Gotamīputra (and grandmother of king Pulumāvi) Pulumāvi styles himself Vāśiṣthīputra Therefore Vāśiṣthī is a part of his mother's name This of course agrees with the grammatical derivations of the words Vāśisthīputra and Gotamīputra

The Śātakarṇi Śātavāhana kings known from inscriptions and mentioned in the Purāṇas are —

I Simuka (No. 1) the founder of the line[3]
II. Kṛṣna (No 2) the brother of Simuka[4]
III Śri Śātakarṇi (No 3) the son of Kṛṣṇa[5]
IV Gotamīputra Śātakarṇi (No. 23)[6]
V Vāśiṣthīputra Pulumāvi (No 24)[7]
VI Gotamīputra Yajñaśrī (No 27).[8]
VII Vāśiṣthīputra Candaśrī (No 29)[9]

In addition there are inscriptions of King Vāśiṣthīputra Chatarpana[10] and king Hāritīputra Śātakarṇi.[11]

Two other rulers whose inscriptions have been found and who have been ascribed to this dynasty are Madharīputra Sakasena (or sata)[12] and Śri Śivamakasada[13]

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[1] For in the case of records in other areas and of other lines we cannot be sure whether the evidence is applicable to this particular case

[2] Luders' list No 1123, *Archaeological Survey of Western India*, Vol IV, Nasik No. 18, line No 9 of the inscription

[3] Luders' list No 1113, Nanaghat cave inscription

[4] Luders' list No 1144, and *Senart in Epigraphica Indica*, Vol VIII.

[5] Luders' list No 1114, and 346 A certain amount of difficulty would appear to be caused by the omission of Kṛsna's name in the Nanaghat cave inscription The mention of Simuka's name and inclusion of his image would point to this king as the father of Śri Satakarṇi The difficulty disappears if we take the term "putra" used in the Purāṇas in a classificatory sense—extended to sons of brothers, just as "tāta' is used for the father and his brothers

[6] Luders list No 1125 and 1105 (for 1126 see Appendix A).

[7] Luders' list No 1142, 1122, 1100, 1123, 1124, 1106, 1248 and Myakdoni inscription

[8] See before

[9] Luders' list No 1341

[10] Bhagwanlal Indraji *J.R.B R.A S.*, Vol XV, p. 313 (Nanaghat cistern inscription)

[11] Luders' list No 1195 and probably 1021

[12] *Ibid*, Nos 1001 and 1002 For the latter part of the name see later.

[13] *Ibid.*, No 1279 (Amarāvati).

The coins of the kings so far found[1] are of the following kings :—

Śri Sāta }
Śri Śātakarni } Probably the same king and same as No. 3 (BMC No. 1, 2, 9 Western India).

Gotamīputra Śātakarni (BMC 253–8 restruck coins of Nahapana).

Vāśisthīputra Pulumāvi (BMC 88–93—All areas).

Gotamīputra Yajñaśrī Śātakarṇi (previously given)

Vāśisthīputra Caṇḍa Śātakarni (BMC 117–25, 127, 129–31).

Vāśisthīputra Śivaśrī Śātakarni (BMC 115=16) (No 26 of Paurānic list).

Coins of other Śātakarnis (mentioned or recognisable as such) are also found, as of Rudra Śātakarni[2] or of a later Krsna Śātakarni[3] These however do not bear the legend raño (of the king) nor is there any prefix mentioning the name of the mother As previously indicated there is another class of coins found at Kolhapur which bear the legend raño and also the epithets Gotamīputra etc. The coin legends are —

Raño Vasithiputasa Vilivāyakurasa—(Vāśisthīputrasya),
R Gotamiputasa Vilivayakurasa, and
R Madhariputra Sivalakurasa.

5 Leaving out for the present, the case of the Madhariputra Sakasena (or Sata) and the kings of the Kolhapur coins and confining ourselves to kings whose names can be identified with certainty in the Pauranic lists, we find that a number of kings bear the name of Gotamīputra and Vāsisthīputra. This makes it doubtful if Gotamī, Vāsisthi are really proper names The name of the royal mother of the Satakarni king of Banavasi is Hariti The Kadamba king who confirmed the grant of this ruler and who from the evidence of his own inscription[4] followed the above Satakarni by some length of time also styles himself Hārītīputra This is also found in the inscription of the Chālukya kings.[5] As we have seen there were other contemporary kings who also styled themselves as sons of Gotamī, Madhari and Vasisthī[6] It may

[1] For convenience references have been given only to Rapson's Catalogue

[2] Rapson, BMC No 179, and Pl VII to pp 2 4 [3] *Ibid*

[4] Luders' list No 1196 *Malavalli pillar inscription of Hāritīputra Swaskandhavarman, of mānavyāsa gotra, king of the Kadambas, Epigraphica, Carnatica,* Vol VII, Shikarpur Taluq inscription No 264 *Talgunda pillar inscription of Haritiputra Kakutsthavarman etc Ep Car.,* Vol VII, SK, No 176.

[5] *Ep Car*, Vol VIII, *Sorab Taluq inscription* No 571

[6] In questions on social organisation and custom, the term con-

therefore be concluded that these do not represent the proper names of the royal mothers but something else which is common to the general groups of queen mothers (Vāśiṣṭhi, Hārītī, etc).

To determine this common factor, we have to examine the evidence of other inscriptions of near about this period and of this locality Almost all the relevant inscriptions will be found summarised in Luders' list of Southern Brahmi inscriptions For convenience references will be given to this list with the number of the inscription (as L 105, etc.), original sources being quoted only where necessary The inscriptions which contain a similar mention of the mother's name as in the case of the Sātakarni kings (other than those previously noted) are as follows :—

Vāśisthiputra Ānaṁda, the foreman of the artisans (avesanin) of the king Sri Śātakarni (L 346) [1]
Mahābhoja Māṁdava Kautsīputra Vehdatta (L 1058)
Mahārathi Kauśikīputra Visnudatta (L 1079)
Mahārathi Gauptīputra Agnimitra (L 1088)
Mahārathi Vāsisthīputra Somadeva son of Mahārathi Kauśikīputra Mitradeva (L 1100)
Rājan Mādharīputra Īśvarasena the Abhira, son of Śivadatta the Abhira (L 1137)
Rājavaidya (royal physician) Vātsīputra Magila (L 1191-92)
Hāritīputra Kondamāna (a Brahman) of Kaundinya gotra (L 1195)
Kauśikīputra Sri Nagadatta (a descendant of Kondamana above) of Kaundinya Gotra (L 1196.)
Rājan Madharīputra Śri Vira Purisadatta of the Iksākus (L 1202-4)
The fragmentary inscription of one Vāśisthīputra (L 1197)
Rājan Haritīputra Sivaskandavarman of mānavyasa gotra, of the Kadambas (L 1196) [2]
Rajan Hāritīputra Kakutsavarman of manāvyasa gotra of the Kadambas [3]

According to the last inscription (Talgunda pillar) the title Hāritīputra had come to be considered hereditary and like a pravara in the family of the Brahman kings of the line founded by Mayura Sarman This point is of great interest and will be

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temporary may be justifiably extended to documents dating one or two centuries before or after the exact period treated inasmuch as social forms do not change appreciably over such periods

[1] This is a Northern inscription, of the Sanchi Stupa but has been included as being definitely of an officer of the Śātakarnis

[2] *Ep. Car*, Vol VII, Sk. 264.

[3] *Ep Car*, *Ibid*, Sk. 176 Other Kadambas also bore the title Hāritīputra as noted previously.

considered separately. Here it is sufficient to note that Hāritīputra was used in this royal Brahman family to denote the descent from the mother and that according to the tradition current at the time of the king fourth in descent from the founder, this usage had been prevalent before their attainment of royalty

While the evidence of the inscriptions of Mahārathis, etc confirm the conclusion arrived at earlier in this essay regarding the metronymics, their use by certain Brahman families indicate the true nature of the same

The contemporary and slightly later inscriptions mentioning Brahmanic gotras are as follows :—

The Hirahadgalli plate inscriptions (L 1200) of the Pallava king Śivaskanda varma mentions Brahmanas of the following gotras—Ātreya, Hārita Bhāradvāja Kauśika, Vātsya

The Mavidavolu copper plate inscription (L 1205) gives the Agnivesa gotra

The Kondamundi copper plate seal (L 1328) of rājan Jayavarman mention Brahmanas of the following gotras :—

Gotama, Tanavya, Kaundinya Bhāradvaja, Kārsnāyana Aupamanyava and Kausika

The inscription of the Kadamba kings mention Brahmanas of the following gotras (apart from those noted) —

King Māndhatrvarma Kaundinya gotra[1] King Madhuvarman—Gautama gotra[2] King Mrgesvarīvarman—Gautama Gotra[3]

As we know from the evidence of the Kadamba inscriptions, the earlier Kadambas ruled over the Sātakarni kings of Banavāsi and the later ones followed them Further the Kadamba line was founded when the Pallavas were already in power If the Banavasi Satakarnis are taken as of the same stock as the Andhras of the Puranas (P45),—an assumption which will be justified later on in this essay—the above gotra names come out as current about a century after the fall of the Sātakarni (Andhra) dynasty in the southern portion of their kingdom As we have seen previously some of the Brahmanas mentioned in the inscription are styled Kauśikīputra and Hāritīputra besides giving their gotra These Brahmanas are of these area—one family being of the Banavasi kingdom and the other (the Kadambas) also presumably of this Southern area from the evidence of inscriptions

In their case the terms Kauśikī, Hāritī forming parts of the corresponding compounds, certainly denote the feminines of the gotra names Kauśika, Hārita But the gotras of these Brahman families are also mentioned and are shown by

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[1] *Ep. Car*, Vol VII, SK. 29.
[2] *Ibid*, VII, SK 66. [3] *Ibid*, VIII, Sb33

the same inscriptions to be descending patrilineally (Kauṇinya, Mānavyāsa) Patrilineal Brahmanic gotras are known from the marriage rules in the Dharma Śastras (written by Southerners like Āpastamba as also those compiled in the North, like the Manusamhita) to be exogamous clans in the strictly ethnological sense of the term. Therefore, in the case of the Brahman families the terms Kauśikī, etc stand for the clan name of the mothers. As the terms descriptive of the mother's name in the Sātakarni and other coins and inscriptions are (with the exception of Mādhari) found to be the same as those which are known to be clan names among contemporary Brahmanas we may conclude that all these prefixes describing mothers are the clan names of those ladies. The conclusions thus arrived at agree with the grammatical significance of the term "Gotamiya Bālasiri" occurring in the Nasik inscription of the 19th year of Pulumāvi—the single instance where the full name of the mother is available [1]

6. With the exception of the Kadambas and the Brahmans mentioned in the Malavalli pillar inscriptions. the names of Brahmans in the inscription have only their patronymic gotras recorded without any reference to the mother's gotra This agrees with the fact that Brahmans follow the patrilineal gotra in the matter of descent. When, therefore, some Brahmans are found, in addition, to mention the gotra of the mother, we may conclude that some social (including socio-economic) regulation regarding the mother's clan was of about the same order of importance as the father's gotra Further, the mention of the clan on the mother's side is made definitely in the form of "son of a woman of such clan" i e the relationship to the maternal clan is indicated definitely through the mother, unlike the general way in which the relationship of patronymic ancestral gotra is mentioned, Hence the presumption is that the social regulation relates to some clan function limited to the family, using this term in the strict sense of the social group of the father, mother and their children [2]

For a term of social relationship 'T' may be looked upon as determined by functions relating to the family, clan and tribe, separately or together Representing these by 'f', 'c' and 't' respectively and considering 'f' to denote function we get T=f (f, c, t)

If in any particular case, the descriptive term or some

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[1] Grammatical derivations by themselves are not at all reliable as is seen in the case of derivation of Maurya from a hypothetical mother Mura or of Śātakarni from Śatakarna.

[2] The terms family, clan, tribe, descent, inheritance, succession are used in this essay (except where the context shows a loose general use) in the sense they are considered to convey according to the Notes and Queries on Anthropology, edited for the British Association (fourth edition)

associated known custom is found to give definite information or value regarding these unknowns, a solution may be obtained. In the particular cases treated here, the terms gotamīputra, etc. show that the tribe is excluded. In other words t=o in the above. Therefore T=f (1,c)

Again the connection with the family is indicated as the mother-son relationship, which is very definite, and always gives only one value (for the mother). The term T is thus shown to be determined by some function of the clan which is restricted to the family group of mother-son [1] The affiliation to the clan determines descent, using the term in the sense of the condition in which a person belongs to the social group of his father or mother With reference to the family i e in the matter of discrimination of rights determined by the father-son relationship and mother-son relationship, the affiliation determines or affects the rules of—

(1) Union of the sexes—usually termed marriage regulation

(2) Succession—in the sense of transmission of rank or other similar social distinction.

(3) Inheritance—restricting the term solely to property

In the case of the Brahmans who mention the patronymic gotras, and also the mother's gotra, it is apparent that the metronymic term T cannot have any exclusive reference to gotra affiliation i e it is not a result of matrilineal gotra affiliation For the application of the patronymic gotra to the actual person concerned (not to his father or mother) as distinguished from the coupling of the mother's gotra with the term denoting mother-son relationship shows that their gotra affiliation is definitely patrilineal. The metronymic was therefore of secondary importance for the gotra of these persons and its use cannot mean that the clan affiliation of the mother by itself determines all three set of rules of marrige, succession and inheritance Its use was therefore brought about in the case of the above Brahmans by one or at most two of the above factors

7. The other inscriptions which mention the mother's clan name may now be examined in the light of the above conclusions They fall into three groups —

(*a*) Inscriptions which mention only the clan name of the mother. These are of some of the Mahārathis, the royal physician and the royal foreman of artisans

(*b*) The Śātakarnis also usually record only the mother's

[1] I have taken the above from some unpublished work of mine incorporated in the lectures on social organisation to post Graduate Students of the Calcutta University A detailed discussion of the determinatives of terms of social relationship will be found in Westermarck's *History of Human Marriage* as also in W. H R. Rivers' *History of Melanesian society.*

clan name ; but as indications are given in many cases of the ancestry of the father they may be classified in a separate group

(c) Inscriptions which mention the clan name of the mother and also the proper name of the father To this last class belong that of the king Īśvarasena (provisionally accepting Mādhari as a clan name), the Mahārathi Somadeva, and the son of the royal physician.

The inscription of the Abhira King, son of Śivadatta, we may compare with the Gunda stone inscription of the time of rājan Ksatrapa svāmi Rudrasiṁha son of rājan Mahaksatrapa Rudradāman The record is of a digging of a tank by his senāpati (general) Rudrabhūti son of the senāpati Bāpaka the Abhira. There is no mention of the name or clan name of the mother The presumption is that the Abhira noblemen did not cite the gotra name of the mother as a matter of general practice but indicated the father's name like the Ksatrapas The case is different with the mahārathi or the son of the royal physician As the inscriptions of class (a) show, the general rule in their case seems to be to mention the clan name of the mother, the father being mentioned with his full title in addition to the use of the metronymic

The case of the Śatakarni kings is different They mention (except the first three kings Nos 1–3) uniformly, the mother's gotra Also sufficient indication is given by a number of their kings that they all belong to some definite kula In the case of the Andhra Sātakarni kings (as distinguished from the Andhra bhrtyas) this kula is the Sātavāhana kula The inscriptions mentioning the kula are as follows —

Simuka L 1113 (Nānāghāt cave inscription)

Kisna · L 1144 (Nāsik inscription of one of his officers

Śri-Śatakarni L 1114 (Nanaghat cave inscription of his queen)

Vasiṣṭhī putra Pulumāvi - Myakdoni inscription of this king

His father, the great Gotamīputra (Nasik inscription of Pulumāvi's time L 1123)

Kuntala is known to be a Satavāhana from Vātsyāyana's Kāmasūtra (II-7-28)

Hāla is so indicated in Bāna's Harsacarita and a verse of the saptaśatī (R B 39)

As pointed out above, both Pulumāvi and his father Gotamīputra belonged to the Sātavāhana kula Therefore the 'Kula" was capable of transmission from father to son i.e , was patrilineal [1]

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[1] See also Pātañjali in corroboration of above resemblance of kula to gotra *Mahābhāsya*, IV, I, 79 (chowkhamba Sanskrit series, the patrilineal character of gotra itself is definitely stated in IV, 1, 162

The "Kula" is mentioned only in the body of the inscription, often apart from the name of the king and never like the metronymic which is invariably adjacent to the royal name and epithet. Therefore the kula which represents a patrilineal clan in embryo was less important than the mother's clan in the matter of regal title. The function of the 'Kula" seems to be to point out the genealogical connection through the males As the founder as well as the intermediate king Hāla, were Śātavāhānas the genealogical connection between the different members of the dynasty is shown to be patrilineal

We may now consider the conclusion that the use of the mother's clan name by Sātavāhana kings was due to one or more of the three factors—marriage rules, succession, and inheritance. If marriage rules were the sole reason for the use of the metronymic, there would be no point in giving prominence to the gotra name of the mother or even any mention of it in royal inscriptions and coins. While, therefore, marriage regulations may be one of the factors[1] this cannot be the sole reason for it Inheritance in the case a of king refers to the succession to a kingdom Theoretically of course inheritance of private property accumulated by a king may be considered, but this is not a possible solution in as much as a rule regarding purely private property cannot affect royal designation. The rule of succession is therefore shown to be the principal factor determining the use of the metronymic in the case of the Śātavāhanas This is in agreement with the conclusion arrived at earlier in this essay that the connection between the X rulers and R rulers was genealogical and probably through males but that the rule of succession was different As we have seen, the kings Pulumāvi as well as Kuntala of the X line were Śātavāhanas like the founders Genealogical connection for both lines was therefore definitely through males, whence it follows that the succession was not through males i e. was through females, this being the only alternative

8. The conclusions arrived at in the preceding section regarding succession can be supported directly from the evidence of coins and inscription of the Śātavāhanas

The coins of the Śātakarṇis fall in two classes .—

(*a*) Those which mention the mother's clan name.

(*b*) Those which do not mention the mother's clan name

The coins which mention the mother's clan name are

Of Gotamīputra

Of Vāśiṣṭhīputra Pulumāvi

Of Gotamīputra Yajñaśrī

Of Vāśisthīputra Caṇḍa śrī

Of Vāśisthīputra Śivaśrī

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[1] Such as exclusion of the mother's gotra from marriageable units

These all have the word "Raño" (of the king) at the beginning of the coin legend just preceding the metronymic. The coins of the viliväyakuras and the Śivalkura are also of this type.

The other coins which can be definitely ascribed to this dynasty are as follows :—

PLACE OF FIND		INSCRIPTION		COIN No
Western India	..	Raño Siri Sātasa	..	Nos. 1 and 2.
Do.	..	Raño Sātakamnisa	..	No. 9
Central India (Chanda Dt.)	..	Siri Pulumāvisa	..	Nos. 88 and 89.
Coromandel Coast	.	Siri Pulumāvisa	..	Nos. 90-93
Andhradesa (Kistna and Godavary districts.)	..	Gha Sadasa (probably Meghasvati of the Purāṇas).		
Chanda Dt	..	SiriYaña Sātakamnisa		No. 164
Surashtra	..	Sātakamnisa		Nos 165-168
	..	Siri Ruda Ṣātakamnisa		170
Uncertain		Siri Ruda Sātakamnisa		No. 179
Krishna and Godavary Dts	..	Siri Ruda Sātakamnisa	..	
Chanda Dt	..	Siri Kanha Sātakamnisa		Pl. VII
	..	(not No 2 of Purānas)		G P 2-4

With the exception of the coins Nos 1, 2 and 9 which are apparently of the third king of the line, the same as that of the Nanaghat inscriptions, none of these coins bear the royal prefix although some of the names are of royal rulers who have elsewhere given the title before the name, invariably accompanied by the mother's clan name.

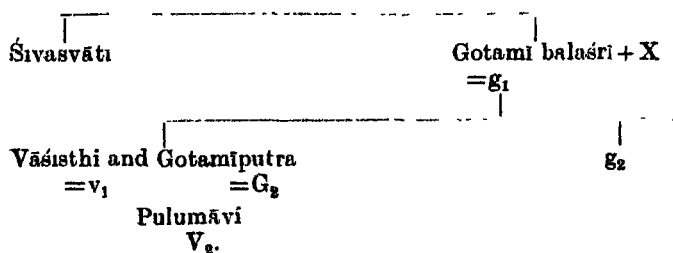
It therefore appears that on the coins of the Sātavāhanas, the royal prefix and the mother's clan name are associated together and also disappear together except in the case of the third king of the line. In the inscriptions also the association is invariable (excluding the doubtful case of Śivamaka sada), except in the case of the third king, Śri-Śātakarni of the Nanaghat cave inscriptions. It has therefore to be concluded that except for the third king of the line, the royal title and relationship to the mother went together In other words, the succession was matrilineal (the holder of the royalty however being always a male).

This is a mode of succession well known to ethnologists and the general feature of it is that the sister's son succeeds the mother's brother In many cases however, the succession goes first to the younger brothers if there are any (one after the other) and then to the sister's son the same process being repeated at each generation Strictly speaking, these males may be considered as acting on behalf of the sister or sister's daughter who is the real heiress. The sons do not inherit the

ancestral property in such cases, but are generally allowed to take what the father has himself earned [1]

9 We may now return to the question of relationship of Yajñaśrī to the famous Gotamīputra Reasons have been adduced in § 2 of this essay for concluding that the two cannot be related as father and son or as brothers As a younger brother's son cannot exclude the son of the king and as all other patrilineal relations would be still more removed, we have to turn naturally to the sister's son, who is besides indicated by the rule of succession holding in this dynasty. As Yajñaśrī was a Gotamīputra we have to conclude that his mother was a Gotamī, like the grandmother of Pulumāvi and his own mother's mother In other words, descent is through the mother in her clan. The remaining function of clan affiliation—marriage rules—is also thus shown to depend on the mother clan

As we have seen previously, the kings who thus appear to follow matrilineal succession and descent, are at the same time united in the patrilineal Kula of the Śātavāhanas Working with actual kings let us see how this is possible

We know that Gotamī Bālaśri was Gotamīputra's mother Also that the latter, according to all the Purānas, was preceded by Śivasvati Hence this king was Gotamī Bālaśrī's brother (at least in the classificatory sense of the term—the nearest clan brother) Using capitals for males and minors for females, the symbol of addition for marriage and the abbreviations v, g, for the gotra names Vaśistha and Gotama, we get (for practical purposes)

Now Pulumāvi as well as Gotamīputra, being Śātavāhanas, it follows that the father of the latter, namely X, was also a Śātavāhana in addition to Śivasvāti and Gotamī. Both partners of the royal pair therefore belong to the same kula As in marriage inside the kula the likelihood would be for the partner to belong to the same generation, the royal pair would be related as cousins of some degree, if not of the first As members of the same

[1] The best summary on this subject will be found in the article on mother right: *Hasting's Encyclopaedia of Religion and Ethics.*

mother-clan generally do not marry in such cases—and this is supported by the different metronymic of Pulumāvi, son of Gotamīputra—the relationship between the royal pair must have been that of cross-cousins i e. children of a brother and of his sister As Śivasvāti and Gotamī are presumably so related, at least in the classificatory sense, the queen of Gotamīputra is probably Śivasvāti's daughter. This is confirmed by the inscription of this queen regarding gift of crownlands which she bestows in her own right.[1]

The slightly later work of Vātsyāyana[2] as well as the earlier work of Bodhāyana[3] mention marriage with the mother's brother's daughter as orthodox in this part of India thereby confirming the above conclusions

10 The available evidence concerning other kings and their consorts—in the Puranas and inscriptions—confirm the above conclusions

The Sopara coin of Gotamīputra Yajñaśrī bears on the reverse the inscription "Gotamiputa kumaru Satakani (Chatar) panasa" As Sir R. G Bhandarkar has pointed out, the "Satakani Chatarpana" is evidently the son of Gotamīputra Yajñaśri, whose name the coin bears on the obverse as that of the reigning king[4] The Nanaghat cistern inscription found by Pandit Bhagwanlal (the finder of the above coin) records the name of a rājan Vaśisthīputra Chatarpana—identified by him with good reason with the above mentioned chatarpana son of Gotamīputra Therefore the son of this Gotamīputra was also a Vāsisthīputra[5]

Again, Vijaya the successor of Yajñaśrī had a son called Caṇḍaśrī, who was a king (No 29 of the Purānas). From the inscriptions we know of a Vāsisthīputra Śrī Canda Śātaka—identified with the above As Vijaya was the successor of Yajñaśri and was not his son, he must have been a Gotamīputra (being the sister's son) We therefore get an alternation of Gotamīputras and Vāsisthīputras for three successive royal rulers and their equally royal sons The Gotamīputras therefore all married their mother's brother's daughters The genealogy from Śivasvāti to Candaśrī therefore works out as follows :—

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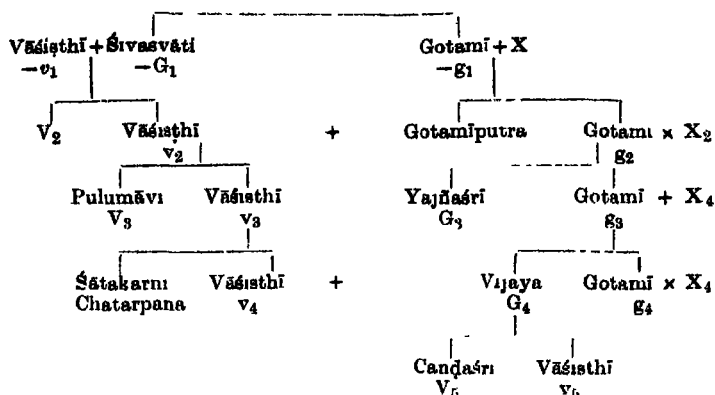
[1] Luder's list No 1126, see Appendix A, and A S W I., Vol. IV, Nasik No 14

[2] *Vātsyāyana*, Kāmasutra III-3-3. The references to the Kāmasutra is given with respect to the arrangement followed in the Chowkhamba edition, Benares

[3] *Bodhāyana*, Dharmasutra, I, 1, 19, (Edition of Pandit Śrīnivāsācarya, Mysore, 1907).

[4] R B 21, note 1. The unworn coin found by the Pandit had "panasa" and traces of "chatara" (the coin was badly stamped); the cistern inscription is "Raño vasathiputasa chatarapana satakanisa" showing that chatarapanasa is the correct form.

[5] See Appendix B.

We have now to consider who are the husbands of the Gotamīs g_1, g_2, g_3, g_4 the royal mothers As concluded in the preceding sections, the succession was matrilineal in this dynasty, but at the same time the royal sons Pulumāvi, and Candaśrī were rulers over considerable kingdoms The Śātakarṇi Chatarapana had certainly royal rank as he is definitely styled rājan in the cistern inscription, though in the coin he is not so styled Above all, the great Śrī Śātakarṇi, son of Kiṣna was not only an independent king, lord of dakṣiṇāpatha, but the sovereign power of his time established by the successful performance of the Rājasuya *ceremony* The presumption is that the royal sons are represented in the line of rulers excluded from the Vāyu and Brahmānda accounts

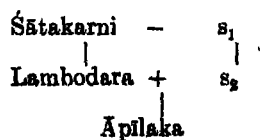
Let us now examine the relationship of three of these royal sons represented in the genealogy given above It is at once noticed that each succeeding ruler is the sister's son of the preceding king As these Vāsiṣṭhīputras thus follow the same law of succession as the Gotamīputras, mention the mother's clan name just like them and are also Śātakarṇis and very near relations of the latter kings, belonging, like them, to the Śātavāhana Kula, we are justified in concluding that their marriage rules were also the same as that of the Gotamīputras That is, the Vāśiṣṭhīputras also married their mother's brother's daughters

In the Nasik inscription of Gotamīputra and Pulumāvi, Gotamī Bālaśri is styled Mahādevi, a title applied only to the principal queen of a king. That the Śātakarṇi Śātavāhanas followed this mode of address is shown by the mention of Mahādevi Malayavati queen of Kuntala Śātakarṇi in Vātsyāyana (II-7-28). The father of Gotamīputra was therefore a king As he could not have preceded Gotamīputra, in place of Śivasvāti, his rule must have been over some other kingdom. The fact that several generations of fathers and their royal sons had ruled over the realm of the R rulers and the Paiṭhan king-

dom of the Q rulers, create a presumption that the father of Gotamīputra may have been a ruler of the latter kingdom.

A question might arise that the Q rulers do not necessarily represent rulers over the same kingdom. But their inclusion in the Paurānic list (Matsya) shows that they were very powerful kings. This is borne out by references in literature (Kathāsarit sāgara, etc) which associates them with Pratiṣṭhāna and the Deccan Inscriptions show that two of these kings were acknowledged to be lords of dakṣiṇāpatha, while one of them performed the Rājasuya. Distribution of coins and inscriptions of the Vāsiṣṭhīputras show that this area was largely within their realm The genealogy so far drawn up also postulate a continuity in the line of Q rulers. Also, we know of no other line of Śātakarni Sātavāhana rulers. The Hārītīputras and others were of different kulas and besides do not seem to have been powerful enough to have been given a place in the Paurānic main lists.

The homogeneity of Q rulers may therefore be taken as established The presumption that the father of Gotamīputra was a Q ruler may now be examined in the light of further evidence from the Purāṇas. The Matsya list names three kings (6-8) Śātakarni, Lambodara and Āpīlaka who follow one another, as related patrilineally in the descending line—Lambodara being styled son of No: 6 and Āpīlaka son of Lambodara According to the succession postulated, however, Lambodara cannot succeed Sātakarni In agreement with this we find that Lambodara is excluded from the revised versions. But the question arises, how could Āpīlaka, the son's son of Śātakarni succeed him in place of the sister's son This may of course be possible if Lambodara married his father's sister. As we have no evidence of this form of marriage among the Śātakarnis, and other explanations suffice, this possibility may be ruled out The long reign of Śātakarṇi (56 years) is sufficient to account for the royalty passing on to the second generation after him The rule of succession however requires that this successor should be the sister's son of the sister's son of Śātakarṇi i.e, his sister's daughter's son. This means that the mother of Āpīlaka was Satakarṇis sister's daughter, while the father of Apīlaka was Śātkarni's son

Śātakarni — s_1
| |
Lambodara + s_2
|
Āpīlaka

(s_1, s_2 represent the sister and sister's daughter of Śātakarṇi.) This agrees with the inferences about X, father of Gotamī putra Such a conclusion would be in harmony with the fact that sons of R rulers were provided as Q kings; whence, the latter being

very powerful, in their own right, they might, in their turn try to provide their sons in the R kingdom. The equation V_1 to X_1, V_2 to X_2 and so forth, foreshadowed by the case of Gotamīputra's father and greatly strengthened by the subsequent analysis may therefore be definitely postulated. It amounts to marriage with the father's sister's daughter in addition to the previously proved system of marriage with mother's brother's daughter. It is in fact the fully developed cross-cousin-marriage As these two forms of cross-cousin marriage often go together, especially in South India this would be nothing unusual.[1]

One important effect of it is that the mother's brother and father's sister's husband are the same person and also the father of the wife or husband. This peculiar state of multiple relationship enables us to understand why the Pauranic writers, although recording names of kings known to be related as father and son in series, could not generally indicate the relationship of any king to his successor For the social rules must have led to a definite terminology of relationship[2] and a special term used to denote the multiple relationship between succeeding kings of each line (sister's son, daughter's husband, etc) As the language in which the Purāṇas were written were of a society lacking in such social rules and terminology of kinship, it was not possible to translate the same and indicate the relationship This removes a difficulty which would otherwise stand against the view that the writers of the Puranas really knew the succession and that the revision was based on genuine scholarly work

11. In the final paragraph of the preceding section, I have tacitly assumed that the Śātakarṇis were a homogeneous group of people, among whom this special type of marriage prevailed For the terminology of kinship cannot be fixed or altered by a peculiar practice of a single family like the kula of Śātavāhana. To justify the assumption we have to examine the contemporary inscriptions and literary records.

Out of a total of nearly 400 inscriptions collected by Lüders in his list of the southern records, only those which have been previously indicated mention the mother in the prominent fashion noted The remaining inscription record the name of the donor and (usually) his profession, the place of his birth or the father's name or both. The records include people

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[1] W. H R Rivers, *Journal of the Royal Asiatic Society*, 1907, p 611 ff.

[2] The dependence of the terminology of kinship, including Indian examples of the same will be found in W H R Rivers, *Kinship and social organisation*.

See also K P. Chattopadhyay, *Kinship and Levirate in India*, *Man*, March, 1922.

from Kalyan[1] Nasik[2] Sopara[3] Chemula[4] Vaijayanti[5] Dhanakakata[6] and Pratisthāna[7] The professions or castes of these donors are of merchants[8] bankers[9] goldsmiths[10] jewellers[11] black smiths[12] officials[13] Brahmans[14] gardener[15] ironmongers[16] traders[17] carpenters[18] ploughman[19] fisherman[20] perfumers[21] and corndealer.[22] In no case do they record the mother's clanname or record her name before the father's name (where these are given) The parentage is given with reference to the mother only in two cases, and these bear no special import as not mentioning the clanname of the mother (L1252, 1260).

As we have seen, the people who lay stress on the maternal side in their indication of descent, are the Śātakarnis of the Sātavāhana and other kulas, certain of their officers, and the Mahārathis. Further, all officials of the Śatākarnis did not follow this practice. It was not therefore followed (by such as those who did so) by virtue of their office

The case of the Mahārathis has to be considered in detail owing to different interpretations given by different scholars to that term.

The Kanheri Buddhist cave inscription of the time of rājan Hārītīputra Vinhu kada Chutu kulānanda Śāta karni (L 1021) describes the donor as the daughter of a mahārāja and a mahābhojī; a maharathinī and the mother of Skandanāga Śātaka

The Nanaghat inscription describes the queen of Śrī-Śātakarni as the daughter of the Mahārathi Kalalāya, the scion of the Amgiya kula (L 1112).

The Banavāsi stone inscription of the time of the rājan Harītīputra Vinhukada Chutu kulānanda Śātakarni mentions a mahābhojī who is the daughter of a mahāraja. The Kuda Buddhist cave inscription mentions the donor as lekhaka or writer to the Mahābhoja Māmdava Skandapālita son of Mahābhojī (L 1037).

Coins have been found in Chitaldrug in Mysore, (B. M No 233 and others) bearing the legend "Sadakana Kalalaya Mahārathisa."

The Banavāsi inscription mentions a Mahabhojī as

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[1] Luders' list, Nos. 986, 998, 1000, 1001, 1005, 1032, 1177, etc
[2] Ibid, 985 and 1109
[3] Luders' list, 995.
[4] Ibid, 996 and 1033
[5] Ibid, 1087.
[6] Ibid, 1090, 1092, 1097 and 1121
[7] Ibid, 1187
[8] Ibid, 995, 998, 1000, 1001, 1024, 1214, etc.
[9] Ibid, 1063, 1064, 1073 and 1109
[10] Luders' list, 986 and 1177.
[11] Ibid, 1005.
[12] Ibid, 1032.
[13] Ibid., 996, 1033, 1037, 1045, 1139, etc.
[14] Ibid., 1036 and 1050
[15] Ibid, 1051 and 1061
[16] Ibid., 1055.
[17] Luders' list, 1062, 1065 and 1066
[18] Ibid., 1092.
[19] Ibid, 1121
[20] Luders' list, 1129.
[21] Ibid., 1187.
[22] Ibid., 1180.

daughter of a Mahārāja; the Kānheri record shows that a Mahārathinī was daughter of a Mahārāja and a Mahābhojī his wife The fact of being Mahābhojī and Mahārathinī were therefore considered worthy of mention along with the relationship to a king The Nānāghat inscription shows us a royal queen who is daughter of a Mahārathi The coins of Kalalāya indicate that the fact of being a Mahārathi was considered important enough to be mentioned in the coin legend. From a comparison of the coins of the Śātakarni kings, the term Mahārathi appears to indicate a title, presumably inferior to that of a king The Kuda inscription shows that the donor considered his employment as lekhaka to the Mahābhoja important enough to mention it in the record. From a comparison with the inscription of the foremen of artisans and other officials of the royal Śātakarnis, we have to infer that Mahābhoja also indicates a ruler of some kind, presumably inferior to a king The Hirahadagalli plates contain a notification of certain gifts by the Pallava king to rājakumaras, senāpatis, ratthikas, mādabikas, deśadhikatas, bhojakas of various villages and others in the Satahani ratha, i.e province of Śātakarnis or Śātavāhanas The terms ratthikas and bhojakas here undoubtedly refer to titles and privileges The terms mahārathi and mahābhoja, from the known force of the affix mahā in mahākṣatrapa, mahādevi, mahāraja, therefore mean overlords of ratthikas and bhojakas or a superior grade of ratthikas and bhojakas The closeness of ratthika to the terms senāpati and rājakumara suggest that it (and consequently Mahārathi) betokens a higher dignity than bhojaka (and hence Mahābhoja). These conclusions agree with the evidence of the coins and inscriptions. They further bring out that the Mahārathis and Mahābhojas were often connected by ties of marriage and descent to the kings and some are mentioned as Śātakarnis It may therefore be concluded that they represent the ruling aristocracy and belong to the same tribe or group of people The officials who differed from other officials in following the aristocratic custom of mentioning the mother's class name also presumably belonged to the same stock.

The Mahārathi Somadeva son of the Mahārathi Mitradeva seems to differ from the above people in mentioning the father's name in addition to the mother's clan name. His case has been briefly considered along with other members of the group (c) of § 7 of this essay As pointed out there, the son of the royal physician also records the name of the father in addition to the metronymics These two cases are not quite parallel to that of the Abhira king The distinction in the case of the son of the royal physician certainly cannot indicate difference of custom inasmuch as his father uses only the metronymic In his case the name and official position of the father seems to be mentioned as indicating the position at court, held by the latter

and incidentally the social elevation reflected on the son. The case of the Mahārathi Somadeva may be parallel to that of the son of the royal physician or it may point to a real difference of social custom With the meagre data available from a single inscription, nothing further can be said The alternative that the divergence found in this record may be due to a difference of social custom does not go against the previous conclusions regarding other Mahārathis, inasmuch as all Mahārathis need not have been of the same social group, although they generally seem to have been drawn from Śātakarnis and their relations.

12 We may now proceed to recast the Pauranic genealogies in the light of the conclusions so far made As we have seen, there were two lines of rulers, with matrilineal succession The line associated with Paithana and the title "lord of dakṣiṇāpatha" is that excluded in the later account As however the original list of the Matsya (and Bhaviṣya) was a joint list of both lines and the two sets of kings very closely related,[1] it is quite possible that one or two cases may have been overlooked in the final revised list. The Vāyu shows in some Mss such incomplete revision with respect to No· 7, Lambodara son of Śātakarṇi, No· 6 As we have seen, the succession was to the sister's son, the own son being heir to the other kingdom Lambodara must therefore have been a king of the Q kingdom and not of the R realm. This agrees with the general Vāyu and Brahmāṇḍa lists. The peculiar manner in which the son of Kṛṣna,—Śātakarṇi (No: 3)—is mentioned leaves no doubt that he was not a king of the R line For it is stated that he was a great king; but there is no mention of regnal period although it is given in the earlier account The obvious meaning is that his name is mentioned only as he was a great king and son of Krsna (and as we shall see, one who performed the Rājasuya)—but no regnal periods were given as he did not reign in the R realm The only genuine case of overlooking in the process of revision seems to be that of Candaśrī, son of Vijaya. He could not, on the hypothesis put forward, have reigned in the R kingdom but must have been a Q ruler

As the two Śātakarnis, No 3 and No 6 were of the same generation, and No 3 ruled only 10 years Lambodara should come before Purnotsaṅga Candaśrī will come after Śivaskandha Śātaka.

According to the Puranas, Simuka was the founder of the line and was succeeded by his younger brother Kṛṣṇa. The next king named in Matsya is Śrī—Śātakarṇi, who the later

[1] The relationship at any point may best be described as follows.—The son of the king of one of the kingdoms was the heir to the other realm. The son of the king's sister was the heir of his realm. Also, every king was related as grandson in the male line to his second predecessor

versions make it clear was not a R ruler. As the inscriptions at Nānāghat show, he was lord of dakṣiṇāpatha i.e. he was associated with what has been called the Q kingdom. In the revised list, the next king is Śātakarni (No: 6) who ruled for 56 years On our hypothesis, he should be the sister's son of Kṛṣṇa, being his successor in the R Kingdom As the inscription of Kṛṣṇa's officer at Nasik shows, part at least of the Q kingdom had been ruled over by him The southern home of the Śātakarṇis and their recent rise to power however make it clear, that it was probably conquered territory. This would mean that the son succeeded to the conquered realm, and the sister's son to the inherited kingdom. This agrees with the fairly general practice, among matrilineal people, of the son getting the property acquired by the father, while the sister's son takes the inherited ancestral property.

Treating this as the point of separation of the two lines of Śātakarṇis we get :—

* Correcting the obvious mis-spelling Svātivarna Although not shown in this table, there is a break in the line of Q Kings here

It is apparent that the correctness of the hypothesis put forward and the genealogies reconstructed on its basis can be rigorously tested by means of dating derived from independent sources

The date of the rulers of this dynasty may be obtained from

(a) The Synchronism of Kharavela with Śatakarni, generally accepted as No 3 of the Nanaghat cave inscriptions [1]

(b) The position of the Andhras as successors of the Kanvas and Sungas in the Pauranic accounts

(c) The synchronism of Śatakarni lord of dakṣiṇāpatha with Mahaksatrapa Rudradāman (L 965)

The two first modes involve determination of the chronology of other kings They will be discussed later. The last way of approach is easier as inscriptions of Rudradaman are dated in the Śaka era This avenue will be explored first

13 The Nasik inscription of Mahādevi Gotamī Bālaśrī mentions the uprooting of the Ksaharatas and the restoration of the glory of the house of Śātavāhana by Gotamīputra The provinces mentioned in this inscription as conquered by the latter, are found from the inscriptions of Rsavadatta (L1099, 1131-35, etc) son-in-law of Nahapana, and of Ayama the minister of this Mahāksatrapa (L. 1174), to have been largely in possession of the Ksaharata rulor. The coins of Nahapana restruck by Gotamīputra [2] in Nasik district, along with the above facts, leave no doubt—as Sir R G Bhandarkar has pointed out [3] that the victorious arms of Gotamīputra were carried against Nahapana and his successors As the X kingdom of Śātakarni Śātavāhanas had its capital at Paithan [4] it proves that the satraps had overrun and conquered the greater part, (if not the whole of it) of this Northern realm at some period anterior to this Such a conclusion agrees with the interregnum revealed in the Paithan rule if we add up the

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[1] See § 17 of this essay for references

[2] B M Nos. 253–58 Of the Jogalthembi hoard of 14000 coins of Nahapana about two thirds were restruck coins of Gotamiputra. *J B B R A S.*, XXII, P 224.

[3] R B p 28

Most or all of the assumptions made in drawing the above conclusions have been challenged by different scholars. I have not considered it necessary to treat each point separately as arguments and verifications that follow have appeared to make that unnecessary.

Mr R D Banerji's article on "*Nahapana and the Saka Era* Part II" *J.R.A S.*, 1925, and Mr K A Nilkanta Śāstri's article on *Sāta vāhanas*, *in J R A.S* , 1926, may be read for a summary of the objections

[4] Kathāsaritsāgara, Edition of Durgaprasad revised by Kasinath Sarma, Bombay, 1883.

VI-VIII Taranga

McCrindle, Ptolemy, p 175

regnal periods on both sides of the table of Śātakarni rulers up to the accession of Gotamīputra and his son Pulumāvi. For, the total from Simuka down to the predecessor of Gotamiputra is 206½ years; and down to the predecessor of Pulumāvi, only 152 years. Before considering this point further, the actual dates have to be settled first.

As the last recorded date of Nahapana is 124 A. D. and as he was then styled Mahākṣatrapa, it is apparent that the Paithan kingdom of the Śātavāhanas was then practically non-existent Pulumāvi son of Gotamīputra must therefore have come to the throne of Paiṭhan after this date As his regnal period is given as 28 years, it follows that his rule could not have ended before 152 A D. As the Junagad inscription of Rudradāman is dated in Saka 72 i e 150 A. D, the Śātakarni lord of dakṣināpatha referred to by him must be Pulumāvi. According to the Nasik inscription of Gotamī Bālaśrī, inscribed in the year 19 of Pulumāvi's reign, the grandson of the queen, the lord of dakṣināpatha gave a village to allow the cave to be taken due care of, "intending it as a bridge of merit for his father."[1] Gotamīputra was therefore just dead, the cave being inscribed with a eulogium to him and a village given by his son for his happiness in after life As his regnal period was 21 years, it follows that Pulumavi came to the Paiṭhan throne two years after his father's accession to the R Kingdom As Nahapana was over-thrown by Gotamīputra, this raises the lower limit of Pulumāvi's accession to 126 A. D.

The Nasik inscription of Gotamīputra records that, from his victorious camp, Gotamīputra ordered the minister in charge of the Nasik district to make over certain royal lands till lately in the possession of Ṛsabhadatta to certain monks The beginning of the inscription corresponds with records of this class dated from "victorious camp" where the king stopped during progress[2] This was in the eighteenth year of his reign and therefore the sixteenth of Pulumāvi This reconquest of Govardhana shows that some one had occupied this territory between the overthrow of Nahapana and the sixteenth year of Pulumāvi. The lower limit for this reconquest therefore comes out as 142 A. D The inscriptions of Pulumāvi at Nasik in the 19th and 22nd year and at Karle in the 24th year of his reign show that he had remained in possession of this area since the reconquest. The Nasik inscription of Yajñaśrī in the seventh year of his reign and therefore 26th year of Pulumāvi (since Yajñaśrī succeeded Gotamīputra, father of Pulumāvi) confirm this conclusion. The lower limit for Pulumāvi's 24th year is 150 A. D.

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[1] *Archaeological survey of Western India*, Vol. IV, Nasik No; 18. Sir R. G Bhandarkar's objection is based on the idea that Gotamīputra had been dead for 19 years and is not valid.

[2] *A.S W.I*, Vol. IV, Nasik No 13, pp 104-5

and of his 26th 152 A. D. But according to the Junāgad inscription of Rudradāman, the lord of dakṣiṇāpatha had been crushingly defeated and Aparānta occupied by 150 A D.

Overlordship such as claimed by Rudradāman in 150 A. D means subjugation of Nasik and reduction of Pulumāvi to an inferior position As however the Nasik area and position of lord of dakṣiṇāpatha seems to have remained to Pulumāvi since his father's reconquest of Govardhana, it is evident that the date of this latter event must be placed after 150 A. D. We thus get a more approximate lower limit for Gotamīputra's accession He could not have come to the throne before 132 A D

14 According to the Andhau inscriptions, Rudradāman was ruling at Cutch as the viceroy of his grandfather Castana [1] in 130 A. D. This explanation implies that the latter had become Mahākṣatrapa by that time

As Nahapana is found claiming the same overlordship in 124 A D it is evident that he had lost his suzerainty at this date, in favour of Castana It would therefore appear that Gotamīputra had crushed him at a time when he had already been losing ground to the Śaka Satraps The inscription of Gotamīputra from his victorious camp makes it clear that Rsabhadatta son-in-law of Nahapana had been fighting against him in that campaign This would mean that the latter after Nahapana's death had allied himself with the Śaka Mahākṣatrapas. This would agree with the statement in the eulogium in Gotamī Bālaśrī's inscription that he had uprooted the Ksaharata race and destroyed the Śakas, Yavanas and Pahlavas The statement of Ptolemy that Tiastenes (Castana) had his capital at Ozene (Ujjain) and Polemaios (Pulomāvi) at Baithana (Paithan) [2] without any mention of Nahapana agree with the above conclusious As the growth of a rival power at the expense of the Ksaharata Ksatrapas was soon bound to bring it into conflict with the Śaka Mahākṣatrapas, it is evident that the accession of Pulumāvi must have been followed by war with these rulers According to Rudradāman's Junāgad inscription the title of Mahakṣatrapa was won by him by his own valour. This shows that either Castana or his successor had lost the Mahākṣatrapa title and Rudradāman had begun his independent rule, as a mere Satrap

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[1] *Archaeological Survey of India, Annual Report*, 1905 6, pp 166-7 D. R. Bhandarkar, *J. Bomb Br. R. A S*, Vol 23—Epigraphic notes,—gives a different interpretation. For the final view see D. R. Bhandarkar, *Indian Antiquary*, June 1918, p 164 This conclusion was in modification of his earlier views at the suggestion of Mr R. C Mazumdar that the occurrence of the two sets of names was in accordance with the practice of a Mahākṣatrapa having his successor as his viceroy with the title Ksatrapa.

[2] McCrindle, Ptolemy, *Ibid.*

The mention of relationship with the lord of dakṣiṇāpatha in the same inscription and the occurrence of the name of a Śātakarni queen as a daughter of a Mahākṣatrapa, probably Rudradāman, suggests that the victory of the Śātavāhana ruler was followed by a treaty and marriage, the defeated ruler being allowed to continue to rule in an inferior position Pulumāvi's defeat sometime before 150 A. D by Rudradāman is mentioned as the former's second reverse of great magnitude It seems to have cost him Nasik. The inscriptions of Pulumāvi at this place in the 2nd and 6th years of his reign show, he had not suffered any such loss of territory up to that time. His first serious defeat at the hands of Rudradāman must therefore have taken place after this time. Allowing at least two years for the first conquest of Rudradāman and the Śātavāhana re-conquest, and an interval of at least of the same length between this reverse of Rudradāman and victorious campaign, we come to the conclusion that Pulumāvi must have come to the throne before 140 A D

This upper limit of Pulumāvi's accession is obtained by alloting only four years to three great military campaigns involving serious reverses on both sides By the same computation, however, Gotamīputra should have undertaken the re-conquest of the lost territories within a year or so of its loss In that case we should get the year 150-51 A D as the eighteenth year of Gotamīputra's reign for Rudradāman appears to have (and been also assumed to have) but recently defeated Pulumāvi This would make the date of accession of Gotamīputra 132-33 A D and Pulumāvi 134-35 A. D. This agrees with all the previous deductions and does not necessarily require the allotment of an increased period for the victorious campaigns of Rudradāman As they appear to have taken place after the 6th year of Pulumāvi, we get a maximum interval 9-10 years for all four campaigns. As Rudradāman's first victorious campaign need not necessarily have been undertaken at the end of the sixth year of Pulumāvi, the above interval cannot be said to go against the computations.

15. We may now return to the question of the interregnum. As we have seen, the two totals of regnal periods of rulers before Gotamīputra in the R kingdom and Pulumāvi in the X kingdom do not tally The total for the X kingdom falls short of the other by 54½ years at the accession of Gotamīputra and therefore by 56½ years at the crowning of Pulumāvi Assuming that there was only one interregnum the point of breach in the Paithan line may be easily obtained As the overthrow of this kingdom took place 54½ years before the accession of Gotamīputra, it would correspond to the end of the year one, of Mantalaka, in the R kingdom Calculating down from Simuka, we find that Mantalaka of R kingdom and Svātikarna (No 14) of the X kingdom came to the throne in

the same year. As Svātikarṇa ruled for one year only and there is no other king between him and Pulumāvi, son of Gotamīputra, the break in the line must have occurred at the end of his reign of one year

The other kings with short reigns are Nos 11-13, 17-18, 20, 21, 25, 26, 28, 29, and 30 As is evident from the tables, rulers numbered 28 and 30 represent the two last kings of the R line and 25, 26, and 29, of the X line Those numbered 11-13 are the immediate predecessors of Svātikarna and 17, 18 the contemporaries of this ruler in the R kingdom As the kingdom broke up shortly after Yajñaśrī's and Pulumāvi's reigns, and as a similar break up took place at the time of Svātikarna, the short length of regnal periods compared to the average (17 for R kings and 13 for X kings) agree with the other facts Regarding rulers 20, 21 which might be considered as not fitting in with the above facts, we find that the accession of Hāla in the R kingdom was immediately before the overwhelming of the dakṣiṇāpatha kingdom Mantalaka who begun his rule at the time of this catastrophe is described as a very powerful sovereign This can only mean that he carried on vigorous warfare against the invader and was successful. The long reign of his successor supports this conclusion The extremely short reign of the two immediate successors of Purikasena therefore indicates a weakening of the R kingdom. This agrees with the fact that we do not get an X king until a much more stable condition is reached in the R kingdom. The recovery seems to have again begun under Śivasvāti and the kingdom attained its full vigour with the accession of Gotamīputra

One objection may be raised here We have previously postulated that the mother of Gotamīputra being styled Mahādevi, his father must have been a royal ruler. It was concluded that his rule was over the X kingdom But we do not find mention of any such king in the Pauranic lists The objection is not however serious The title and succession may have been passed on from uncle to nephew as before, without there being any remnant of the actual kingdom or at any rate, of the sovereignty. Also, Gotamī Bālaśrī being the actual heir to the R crown, was styled Mahādevi. Her brother, and after him, her son, ruled as her representative, their titles being derived by virtue of the powers exercised by them by delegation Her title would not therefore be affected by her cousin—husband having lost his kingdom.

We may now proceed to the far more important question of actual dating of the reigns of the monarchs. The Nanaghat inscription of Śri Śātakarṇi shows that he performed the Rājasuya ceremony. As the successor of the Kaṇvas and Śuṅgas in the Pauranic list, this was a vindication of the claim of the Śātakarṇis as the paramount power of India Their overthrow by any other ruler would practically mean that the

latter became the suzerain power of India The Hāthigumpha inscription of Kharavela[1] shows that at least one aspirant to overlordship undertook an expedition in defiance of the Śātakarṇis, though not against them. Actually the latter were finally destroyed by the Śaka Satraps who thereby became the greatest power in Western and Southern India.

In the preceding section we have seen that Gotamīputra came to the throne in 132-33 A D. As this is Śaka 54-55 and the overthrow of the X kingdom took place 54½ years earlier, it follows that the beginning of the Śaka era and the overwhelming of the Paithan rulers by the Satraps synchronised. In as much as these Kṣatrapas and Mahākṣatrapas mark their records in the years of this era, it is evident that the beginning of the era commemorates the overthrow of the then paramount power of India by the Śakas (whether these were actually the Kṣatrapas or were their overlords being left open).[2]

Although the name of the era is Śaka and is mentioned in the earlier inscriptions as Śaka-nṛpakāla, later records show them as Śālivāhana Śaka and in one case as the era of Śātavāhana[3] This latter piece of evidence and that of the lexicon Hemacandra to the effect that Śālivāhana is a corruption of Śātavāhana, show that the era had some connection with the Śātavāhanas as well as Śakas This is of course true in as much as it is connected with the overthrow of the Paithan Śātakarṇis and probably to some extent also of the other kingdom of this people The immediate recovery of the latter under the powerful Mantalaka who came to the throne in 78 A. C. agrees with the tradition of the defeat of Vikramāditya of Ujjain by Śālivāhana to whom popular Western Indian tradition ascribes the Śaka era

The above view of the Śaka era is not the one generally accepted A criticism of other hypotheses appear however superfluous as the evidence adduced in support of this view appears to be conclusive

The chronology of the Śātakarṇis thus arrived at may now be put down in terms of the Christian era, assuming that there was no other interregnum except the one discussed.

No.	Name.	Regnal Period.
1	Simuka ..	.. 75-74 B.C. to 53-52 B.C
2	Kṛṣṇa ..	.. 52-51 B C. to 43-42 B.C.

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[1] K P Jayaswal, *J. B O. R S*, 1918, p. 364 ff

[2] The term Śaka is here used in the sense in which the era is termed Śakanṛpakāla, without any ethnical reference as to who these people termed Śaka by the Indians, actually were.

[3] *Ep. Car.*, Shimoga, Vol. VII., Introduction, page 38, on SK 281.

X KINGS.

3	Śrī Śātakarṇi ..	.. 42-41 B C to 33-32 B.C
7	Lambodara ..	. 32-31 B C to 15-14 B C
4	Purnotsaṅga ..	.. 14-13 B C to 4-5 A C
5	Skandhastambhi	.. 5-6 A.C to 22-23 A C.
9	Meghasvāti ..	.. 23-24 A.C to 40-41 A C
10	Svāti ..	.. 41-42 to A C 58-59 A.C
11	Skandasvāti ..	. 59-60 A.C. to 65-66 A C
12	Mṛgendra Svātikarṇa	.. 66-67 A C to 68-69 A.C
13	Kuntala Svāti	.. 69-70 A C to 76-77 A C
14	Svatikarna ..	.. 77-78 A.C. to 78 A.C.

Interregnum from 78 A C to 133-34 A.C.

24	Pulomāvi ..	.. 134-35 A.C. to 161-62 A.C
25	Śivaśrī Pulomā	.. 162-63 A C to 168-69 A C
26	Śivaskandha Śātaka	.. 169-70 A.C to 171-72 A C
29	Candaśrī ..	.. 172-73 A.C to 174-75 A.C

(See Appendix B for Nos. 25, 26 and 29)

R KINGS

6.	Śātakarṇi ..	.. 42-41 B C. to 14-15 A C
8	Āpīlaka ..	.. 15-16 A.C. to 26-27 A C
15	Pulomāvi ..	.. 27-28 A C to 50-51 A C.
16	Aristakarna .	.. 51-52 A C to 75-76 A C
17	Hāla ..	.. 76-77 A.C to 76-77 A C
18	Mantalaka ..	.. 77-78 A C to 81-82 A C.
19	Purikasena ..	.. 82-83 A C to 102-103 A C
20	Sundara ..	.. 103-04 A.C to 103 04 A C
21	Cakora ..	. 104-05 A.C to 104-05 A.C
22	Śivasvāti ..	.. 104-05 A C to 131-32 A.C
23	Gotamīputra .	.. 132-33 A C to 152-53 A C
27	Yajñaśrī ..	.. 153-54 A.C to 181-82 A C
28	Vijaya ..	.. 182-83 A C to 187-88 A C
30	Pulomāvi ..	.. 188-89 A.C to 194-95 A.C

The other kings with metronymics similar to that of Śatavāhanas do not concern the above chronology. Their place in the scheme of things will be found discussed in Appendix B of this essay It will be evident that the above chronology fits in extremely well with the known facts about Sātakarṇis and their relations with the Śakas.

16 We may now proceed to discuss other evidence bearing on Sātakarni chronology As noted previously, they are derived from the inscription of Kharavela at Hāthigumpha and from the Pauranic chronology of Śungas, Kanvas and Mauryas Both lines of approach require that there should be some definite

point from which to measure the interval. The best fixed point for this purpose is furnished by the accession of Candragupta Maurya to the throne of Magadha

The date of this event has been generally taken to be 321-22 B C. on the ground that (*a*) Candragupta came to the throne after Alexander's invasion of the Punjab and (*b*) that he was ruling over India when Seleucus tried to win back Alexander's lost dominions. The Indian and Greek data relevant to the matter has been examined at some length by Lassen and others and the conclusions regarding the upper limit of Candragupta's accession rest essentially on the same.[1] The analysis is however vitiated by the fact that the scholars depended on the misreading in Justin—" Alexandrum " in place of " Nandrus "[2] as supporting Plutarch's statement regarding the presence of Androkottos in Alexander's camp.[3] The underestimation of the value of the tradition preserved in the Mudrārākṣasa also led to reliance being placed on statements which will be shown below to be untrustworthy on this point

The statement of Plutarch referred to above, is as follows:—

" Androkottos who was then but a youth, saw Alexander himself and afterwards used to declare that Alexander could easily have taken possession of the whole country, since the king was hated and despised by his subjects for the wickedness of his disposition and meanness of his origin "

On the face of it, the latter part of the statement regarding Alexander's chances of conquest seem to be unreliable, in as much as the information about Candragupta after Alexander's times was derived from Megasthenes. The latter was an envoy at Candragupta's court from the defeated monarch Seleucus. and statements like " afterwards used to declare, etc.," look extremely untrustworthy in such case Apart from this however, there is sufficient evidence to show that Plutarch's statement has no more value than an idle tale

The other historians of Alexander do not mention anything like the alleged meeting of Candragupta and the Macedonian. Justin who mentions Candragupta's humble birth, his flight from Nanda to escape his wrath, the omens of his future greatness and also of his rule contemporaneously with Seleucus,[4] has nothing to say about this remarkable circum-

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1 Lassen, *Indische Altertumskunde*, Vol II Leipzig, 1876

For his discussion of Justin, whom he quotes, see p 207, note 3; for Plutarch, see note 2 of the same page

2 W McCrindle, *The Invasion of India by Alexander the Great as described by Arrian*, Q Curtis, Diodoros, *Plutarch and Justin.*

Justin—Book 12. Cap VIII, Footnote to page 327.

3 *Ibid*, Plutarch, Cap LXII

4 McCrindle, *Ibid*, Justin, Book 12, Cap. VIII.

stance. Diodoros and Curtius do not mention it and agree in putting the account of the low origin and unpopularity of the reigning king of the Prasii and the Gangaridæ in the mouth of Porus.[1] Arrian in his Anabasis states nothing about this ruler beyond the power of his army, but in the Indika, he makes the following statement apropos of previous foreign invaders of India

"However they admit that Alexander came and overcame in battle all the nations whom he visited and that he had conquered them all if his army had been willing"[2]

This statement of Arrian shows it to have been a general view current among Greeks regarding the opinion of Indians on the respective strength of Indian States and Alexander's empire It is practically the same as that which Plutarch puts in the mouth of Candragupta, regarding this point. This portion of Plutarch's statement regarding alleged views of Candragupta therefore turns out to have been foisted on that monarch although the actual opinion was of Greek admirers of Alexander The other part of Plutarch's statement being totally unsupported, loses correspondingly in value.

Except on this point of Candragupta's presence in Alexander's camp, the statements about the ruling sovereign whom Alexander's army was not prepared to fight, are however the same in Plutarch as in others and thus support each other on those points According to Diodoros and Curtius —

(*a*) This ruler was very powerful[3]

(*b*) His name was Xandrames (Diodoros) or Agrammes (Q Curtius)

(*c*) The king had overthrown and killed his predecessor and his sons, and occupied their throne

(*d*) The predecessor had stood in the relation of father to him but was not really his father, the usurper being the illegitimate issue of this predecessor's queen by her paramour.

The name Xandrames is equivalent to Candramas just as Sandrocoptos stood for Candragupta Agrammes was probably a corruption of the same order as Androkottos

Therefore the available information from Greek sources show that the ruler of Magadha at the time Alexander's defeat of Porus (326 B C.)—

(*a*) was of name Candramas, or something like it;

(*b*) had overthrown and killed his predecessor and his sons, usurping the throne;

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[1] *Ibid*, Diodoros, Book 17, Cap. XCIII, Curtius Book 9, Cap II.

[2] *Arrian's Indica* (Translation by E. J. Chinnock, Cap. IX, pp. 410, London, 1893).

[3] Arrian also mentions this. See McCrindle, *Ibid.* Arrian Book 5, Cap. XXV.

(c) was the illegitimate child of his predecessor's queen, being looked upon as a sort of son to the former ruler.

Although this king of Magadha has been identified with Dhanananda of the Mahāvaṁśa account, there do not appear to be any grounds for doing so, as will appear from an examination of the relevant data.

First of all let us find out the kings who are possible as rulers of Magadha in 326 B C. The identification of Candragupta Maurya with Sandrokoptos who repulsed Seleucus is a piece of definite information which enables us to do so on the basis of contemporary evidence As Seleucus was on his way back from the Indian campaign in 302 B.C. to join in the war that led to the overthrow of Antigonus at the battle of Ipsus in 301 B C., the lower limit for the Indian invasion comes out as 303 B C. The upper limit is probably fixed by 306 B C when Seleucus assumed the title of king. The actual date of the invasion has been taken as 304-5 B.C [1] As Candragupta was visited several times by the envoy of Seleucus, Candragupta may be taken as ruling in 303-4 B C.

According to the unanimous evidence of the Purāṇas, as well as of the Buddhist chronicle Mahavaṁśa and the Jain account Sthavirāvali carita, the predecessors of Candragupta were the Nandas whom he overthrew [2] This agrees also with the statement of the foreign authority Justin The lowest estimate of the reign of the Nandas in the different chronicles is 22 years As Candragupta was powerful enough in 304-5 B C to repulse Seleucus, it is apparent that the lower limit for his accession and overthrow is earlier than this date Hence the Nandas are the earliest possible rulers in 326 B C according to the unanimous evidence of Indian and foreign authorities But Candragupta is himself given a reign of 24 years in all the Indian chronicles As he seems to have been ruling in 303-4 B C the upper limit of his accession comes out as 326-27 B C In other words he is the latest possible ruler in 326 B C.

We have therefore to select the actual ruler in 326 B C from among Candragupta and the Nandas The latter formed two generations, the father and the sons. Their succession was apparently peaceful The earlier Nanda is described as the legitimate son of a previous sovereign by his Sudra wife in the Purānas [3]—though not in the Buddhist and Jain accounts. The Purānas however recognise no violent overthrow of his prede-

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[1] Cambridge History of India Cap XVII, p 430, Vol. I.

[2] *Mahāvaṁśa*, Turnour, Ceylon, 1837.
Introduction pp. XXVIII to XLII.
Sthavirāvalicarita by Hemacandra (H. Jacobi's edition) Calcutta, 1891, Cantos VI—VIII.

[3] Pargiter: *Dynasties of the Kali Age*, pp 24–26

cessor by any of the Nandas.[1] The only break in the succession of rulers about this period is in fact the destruction of the Nandas by Cānakya and the placing of Candragupta on the throne—circumstances which are corroborated by the Jain and Buddhist chronicles Regarding the origin of Candragupta, the Purānas are silent The Mahāvamśa ascribes his descent to a prince of the Śākya race.[2] As however this chronicle is of Ceylon and was compiled by Buddhists of that country after Aśoka's championship of Buddha's religion, and as it mentions the Indian king quite incidentally, this piece of information requires corroboration Maurya is here derived from Moriya, the name of the family of the Śākyas to which Candragupta's descent is ascribed In the Sthavirāvalicarita, Candragupta is described as the daughter's son of the keeper of Nanda's peacocks [3] The connection of the name Moriya with peacocks is found here as well as in the commentary of the Mahavamsa, though not in the text

A different and apparently much more authentic tradition appears to have been preserved in the Brhatkatha, composed in the Piśāca language, under the Sātavāhana king of Pratisthana Of the original nothing has survived Fragments, purporting to be taken from that work are however quoted in some authors There are also two abridgements based on the original [4] Further, the play Mudrārāksasa (composed about 700 A D or earlier) is said to be based on Brhatkathā.[5] According to this dramatic work, the Brahman Cānakya had been deeply insulted by king Nanda, in revenge for which, he uprooted the latter's family, consisting of king Nanda and his progeny,[6] and placed Candragupta on the throne The latter was of no pedigree (Kulahīna)[7] but from his childhood had given proof of his future greatness.[8] Although described as

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[1] *Ibid* The overthrow of the old Ksatriya kingdoms and the establishment of his own suzerainty by Mahāpadma Nanda cannot of course be meant The known synchronisms of the Mauryas approximate though they are, make it impossible for Mahāpadma Nanda to have come to the throne just before Alexander's invasion

[2] *Mahāvamśa*, Turnour, *Ibid*

[3] *Sthavirāvalicarita*, Jacobi, *Ibid*

[4] Kathāsaritsāgara of Somadeva [The references given in this essay are to the edition of Durga Prasad (Nirnayasagar Press, Bombay, Saka 1811)] and Kathāmanjari of Ksemendra

[5] Regarding the reliability of the plot of the Mudrārākṣasa, see V A Smith, *The Early History of India* (revised edition of 1924) p 45, footnote (1) agreeing with Hillebrandt's view that the plot is based on accurate information and ancient court tradition See also *Cambridge History of India*, vol 1, p 471

[6] *Mudrārāksasa, Edition of K T. Telang*, Bombay, 1884. (Bombay Sanskrit Series No XXVII, pp 25, 27, 29, 30, 119 and 143.)

[7] *Ibid*, p 76, "*prthivyām kim dagdhās prathitakulagā bhūmipatayas pati pape mauryam yadasi kulahīnam vrtavatī*"

[8] *Ibid*, p 273

the son of Maurya[1] he is considered practically a member of the kula of Nanda[2] Rākṣasa, the minister of Nanda, is said (to be likely) to be considered as having come (to Candragupta as minister) in the paternal succession, thereby[3] suggesting that the relationship between Nanda and Candragupta was looked upon as of father and son. This is explicitly stated later on.[4] Candragupta, according to the drama, therefore passed for a son of Nanda, although really the son of one Maurya, and of no pedigree, i e, an illegitimate child.

It follows therefore that he was held to be the issue of the illicit union of Maurya (or a Maurya) and the queen of Nanda That Candragupta passed for a son of Nanda was known to the commentator of Viṣṇupurāṇa[5] as well as the annotator of Mudrārākṣasa,[6] although the actual details given by them regarding the origin are erroneous. The derivation of Maurya (Candragupta) from Murā, a queen of Nanda is purely grammatical and is in glaring contradiction to the definite statements in the play. The phrase pūrvananda sūta in the quotation purporting to be from Bṛhatkathā is also in agreement with the conclusions drawn regarding Candragupta's origin in as much as he passed for a son of the pūrvananda, i e., the Nanda of the earlier generation who had preceded the several brothers who belonged to the succeeding generation A somewhat different explanation of this phrase has been offered but that seems to be unnecessary.[7]

The above pieces of evidence from the Sanskrit (and Piśāca) works receive unexpected confirmation from ancient Tamil literature. In a number of works of ancient Tamil, considered to date from the first century after Christ,[8] there are references to the Mauryan invasion. In one of their

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[1] *Ibid.*, p 76, "*Ānandahetumapi devamapāsya nandam saktāsi kim kathaya vairini mauryaputre*"

[2] *Ibid*, p 158, *nandānvaya evāyam* (in speech of Malayaketu referring to Candragupta)

[3] *Ibid*, *Candragupto pi pitrparyāyāyāta evāyamiti samdhimanuman yeta.* (Referring to Rākṣasa)

[4] *Ibid*, p 169, "*tastu khalu nandakulamanena pitrbhūtam ghātitam*" (Rākṣasa on reason of discontent of supporters of Nandakula under Candragupta); p 218 "*Mauryosau svāmiputras*" (Malayaketu to Rākṣasa.)

That Candragupta was not really of Nandakula is however made clear by Rakṣasa's speech. See also pp 29-30,99 and 102 regarding their extinction.

[5] *Viṣṇupurāṇa*, H H. Wilson, pp. 469 note

[6] *Mudrārākṣasa, Ibid*, pp 4-5, ślokas 27–35.

[7] Hārit K Deb: *J.B O R S*, Vol III, 1917, pp. 91–5.

[8] Kanakasabhai *Tamils 1800 years ago*

Cambridge History of India, Vol I, XXIV. Although the dating has been questioned by other Tamil scholars, the point is not very important as the arguments regarding Candragupta and Mauryas are not affected by a difference of 3-4 centuries in the date of Tamil records

expeditions they came to the assistance of a people called Kosar, apparently their allies when the latter were repulsed by the chief of Mohur These Mauryas are termed "Vamba-Moriyar" or "bastard Mauryas"[1] Dr. Barnett in the chapter on South India in the Cambridge History of India has taken the above terms to refer possibly to Konkani Mauryas.[2] That this is not so, and that the great Maurya emperors are meant is made abundantly clear by the reference to Nandas and their capital at Patali (putra) on the Ganges,[3] by the same author shortly afterwards It is therefore evident that the description in the Greek accounts, of the ruler of Magadha whom Alexander's army refused to fight, agree in every detail with the traditions current in India at about the same period, about Candragupta. As previously pointed out the name recorded in the Greek account, is very like that of the Maurya king Candragupta

It has therefore to be admitted that Candragupta had overthrown the Nandas and was on the throne of Magadha at the time of Alexander's victory over Porus The practical independence of the frontier princes the ambitious schemes of Porus, and the discontent among the subjects against the ruler of Magadha mentioned by the Greek writers, shows that at the time Candragupta had not been able to consolidate his position He was probably then busy putting down the disaffection among his allies and winning over the adherents of Nandas in which object, according to the play Mudrarakṣasa, he succeeded within a short period of time owing to the cleverness of his minister. Candragupta's accession thus comes out as having taken place shortly before Alexander's defeat of Porus The actual date may therefore be taken as 327 B C with a very small probable error This is in agreement with the upper limit of 326-27 B C for Candragupta's accession, arrived at from independent data

17. The date of accession being thus sharply defined as 327 B C, we may proceed to calculate other dates with reference to it A very important document, of which the chronological value has been undervalued by some scholars is furnished by the Hāthigumpha inscription of Kharavela.

The fourteenth line of the inscription contains an undoubted reference to the time of the Mauryas,[4] although

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[1] *Tamils 1800 years ago*, Ibid, pp. 50-51, and 198 quoting Mamulanar, 250.

[2] *Cambridge History of India*, Vol I, p 596

[3] S K. Aiyangar, *Some contributions of South India to Indian Culture* (Calcutta, 1923) pp. 23-27. *Mamulanar Aham*, 251 and 264.

[4] K P Jayaswal and R. D Banerjee, *J.B.O.R.S.*, 1918 (Dec 1917). The text of the Hathigumpha inscription is given on pp. 397–403 of Mr Jayaswal's article The 16th line runs as follows: "Muriyakālam vochhinnam cha choyathi agasatikāmtariyam upādāyati-Muriyakālam

objections have been raised to this reading by Mr. R P. Chanda and others.[1] The principal difficulty raised seems to have been the conclusions regarding dates drawn from it by Prof. Jayaswal He has taken this line to mean that an interval of 164 years elapsed between the time of Candragupta and the 13th year of Kharavela when the inscription was engraved This is however an obviously wrong interpretation The actual sentence shows that the interval of 164 years was "vyvacchinnam," *i e*, separated, from the time of the Mauryas, thus excluding the ruling period of the Mauryas. Hence the reckoning should be from the date of the ending of the Maurya dynasty As regards the duration of this dynasty, all the Purānas agree that it lasted 137 years The more reliable Vāyu and Brahmānda Purānas give an actual total of regnal periods of 133 years.[2] As Aśoka is said to have been crowned four years after the death of his father, the discrepancy between the two actually supports the correctness of the accounts We may therefore take 137 years as the duration of this dynasty. Subtracting this from the date of accession of Candragupta we obtian 190 B C as the date from which to count the interval of 164 years. Kharavela's thirteenth year therefore corresponded to 26 B.C. The date of his accession therefore comes out as 38 B C

On palæographic grounds, the Hāthigumpha inscription of Kharavela and the Nānāghat inscription of Naganika the queen of Sātakarni have been held to belong to the same period to which belongs the Nasik inscription of the time of Krsna.[3] A reference to the chronological tables of Śātavāhana kings reconstructed on the basis of other data, shows that rule of Kṛsna was from 52-51 B C. to 43-42 B.C. and of Srī-Śātakarni (of the Nānāghat inscriptions) from 42-41 B C, in remarkably close agreement to the palæographic data The reference in the 4th line of the Hāthigumpha inscription has been taken to mean a reference to the Śātakarni of the Nānāghat inscriptions, *i.e.*, to Śrī-Śātakarni An invasion in defiance of the latter in the second year of Kharavela's reign would be in 37 B C, *i e*, about the middle of the reign of Śrī-Śātakarni The language shows that Kharavela did not attack Śātakarni actually Kharavela's campaign of universal (Indian) conquest was undertaken in his tenth year, *i e.*, 29 B.C.

vyavachchhinnam cha chatusastyagraśatikāntarīyam upādāpayati" Mr Jayaswal has recently put forward another reading, apparently on account of his inability to solve the chronological difficulties raised by his interpretation (see *J.B O R S.*, 1927, pp. 221–246).

[1] *J.R A.S*, 1919, pp, 395-99, I A, Vol XLVII, 1918, pp. 223-24 Vol. XLVIII, 1919, p, 187-91

[2] Pargiter, *Dynasties of the Kali age*, pp. 27

[3] *Archæological Survey of Western India*, Vol. V, p. 71 (Bühler).

and therefore after the death of Śrī-Śātakarṇi. The reference to the Nanda king (in line 6 of the inscription) who ruled three hundred years before (the fifth year of Kharavela) raises no difficulty as the date referred to comes out as 334 B C, when the Nandas are known to have been rulers of Magadha, and according to the testimony of the Purāṇas, to have established universal sway.[1] The reference to the attack on Rajgrha in the eighth year of his reign and the consequent flight of its ruler to Mathura, and the forcing of Bahasatimitra king of Magadha to acknowledge his overlordship in the twelfth year of his (Kharavela's) reign shows that in 31 B C. and 27 B.C., in addition to his great campaign of 29 B.C he aimed at the subjugation of Magadha and an acknowledgment of overlordship from its ruler There is therefore no question of identification of Bahasatimitra with Pusyamitra involving extraordinary difficulties of chronology and palæography

It may be said that the above hypothesis is open to objection as the Bahasatimitra of the Pabhosa inscription ruled, according to Mr Jayaswal, at a much earlier date, being of the time of the Śuṅga king Odraka or Andhraka [2] This date of Bahasatimitra is however based on a wrong identification.

The Hāthigumpha inscription makes it clear that Bahasatimitra was ruler of Magadha, as the successor of Nandas, at the time (possessing the trophies carried by the Nandas from Kalinga). The finds of the coins of this king, Bahasatimitra, at Kosam and Ahicchatra as also the genealogy given in the Pabhosa inscription shows that he was lord of the above two kingdoms His flight from Rajgrha to Mathura to escape Kharavela agrees with the above facts. It is therefore apparent that Bahasatimitra ruled over the realm of the imperial Śungas in North India, excluding only Vidiśā. Very little room is left for his supposed overlord of the Śunga line of whom the Pauranic name is not Udaka but only bears a resemblance to it.

On the other hand it is clear that the Pabhosa inscription was recorded in the tenth year of a king termed Odraka or Udraka When therefore we find that in the eighth year of Kharavela, Bahasatimitra has to flee to Mathura; in the tenth year the king Kharavela goes forth on a victorious career of conquest of India presumably overrunning Magadha and Kosam; in the twelfth year Bahasatimitra makes full submission to Kharavela and recognises his overlordship and that Kharavela is lord of Odra or Udra [2] we are more likely

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[1] Pargiter, *Dynasties of the Kali Age*, p 25.

[2] The above suggestion regarding the Pabhosa inscription has been made only to point out that Mr Jayaswal's interpretation does not agree with the available facts and therefore forms no real objection to the

to conclude that the reference to the tenth year of Udraka by the uncle of Bahasatimitra, is to the time when Kharavela had overrun Northern India. This agrees with the chronology arrived at previously on other considerations

The palaeographic evidence regarding the Pabhosa inscription agrees with the above conclusions Hoernle, working on an eye copy, judged the characters to belong to about the beginning of the Christian era. Führer with more accurate data based on actual inspection considered the inscriptions to be in characters "of the second or first century B C" Numismatists have placed the early Kosam coins in the third or second century B.C.; but there appears to be no ground for concluding that the coins of this particular king cannot be placed in the first century B.C The coinage of the kings of this realm extended over a space of about three hundred years beginning with the period indicated

The evidence of the Hathigumpha inscription is therefore clearly in favour of the chronology of Śatakarnis arrived at in this essay

18 It may however be objected that the dating leaves no room for the reign of Śungas and Kanvas as made out in the Purāṇas This point may now be discussed All the Purānas state (taking the corrected reading of Matsya) that the Śungas ruled 112 years, while giving an actual total of 118 years The Kanvas are said to have ruled 45 years, the total agreeing with the actual periods [1] This gives us 163 years for the two sets of rulers. The interval between the end of the Maurya line and the coming of the Andhras is however according to the chronology of this essay only 115-16 years The interval between the Mauryas and Andhras has been taken by most Indologists as filled by the Śuṅga rule, the Kanvas being considered contemporaries of the former [2] While this agrees fairly well with the chronology of this essay, there is a very serious objection to it It has been shown that, barring the statement of relationship of the kings, the Pauranic account of Śātakarnis is very accurate Therefore, when we meet with a clear statement in all the Puranas that the last of the Śuṅgas, Devabhūmi was killed by his minister Vāsudeva who thus became the first Kanva king,[3] we have to conclude that the Kanvas did not attain supremacy before Devabhūmi's time. Therefore the Kanvas must have ruled after him there-

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conclusions of this essay. The correctness or otherwise of the interpretation of the term "Udakasa" suggested does not affect the main conclusions of this essay.

[1] Pargiter, pp 30-35

[2] Sir R G. Bhandarkar. *Ibid*, pp 30-31 *Camb. History of India*, Vol I

[3] Pargiter. *Ibid*, pp. 33-34. See also *Harsacaritam* (Edition of Pandit Iswara Chandra Vidyasagara, Calcutta, 1883) pp 173

by making it impossible to accept the current view regarding Suṅga-Kanva chronology At the same time it is clear that if the other conclusions of this essay are correct, there must have been an addition of contemporary reigns so as to make a total of 163 years in place of the 115-16 years deduced from the Maurya-Andhra dates. To settle this point we have to examine the inscriptions, coins and mentions in literature about these rulers. Of the Kanvas we know nothing beyond the information supplied by the Purānas The case is different with the Śungas.

The drama Mālavikāgnimitra, (Circa 400 A D.) written at a time when the tradition of the imperial Śuṅgas was still fresh in the minds of the Brahmanical people, portrays a love intrigue of king Agnimitra, son of Pusyamitra the founder of the line According to this work, Agnimitra was a king of Vidiśā He waged a war and concluded treaties like an independent king,[1] while his father Pusyamitra was busy performing the Rājasuya to obtain recognition as the paramount power of India as the successor of the Mauryas. His title at the court of his son is however senāpati not king like his son[2] The Ayodhya inscription of a descendant of Pusyamitra[3] also mentions him as senapati and as performer of the Aśvamedha It has therefore to be concluded that before seizing the throne of Magadha, Pusyamitra had no right to the royal title although his son held that dignity Some scholars have sought to explain this peculiarity of titles of the two Sungas by suggesting that Pusyamitra seized the throne of Magadha in his son's name. This view is however untenable in as much as (a) the Asvamedha was performed by Pusyamitra and not his son. (b) the Purānas and other Sanskrit works mention him as the first king of the line and (c) from the narrative in the drama, Agnimitra seems to have been a king, for quite a long time before the performance of rājasuya which obtained the recognition of Śungas as overlords of India We have therefore to conclude that Agnimitra's crown did not come to him from his father and that the latter was not a king although the son held the royal dignity The Ayodhya inscription previously referred to, styles the father of Kauśikīputra dharma rājan Dhanadeva, lord of Kośala, merely as Phalgudeva As the inscription records the setting up of a staff by the royal son in memory of the father, there is no question of carelessness or disrespect It clearly shows that in this case also, the son did not inherit the crown from

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[1] *Mālavikāgnimitra, Edition of Shankar Pandit*, Bombay, 1869 pp 8-9 and 105.

[2] *Ibid*, pp. 106-7

[3] N C. Majumder. *Annals of the Bhandarkar Institute*, 1925-26, Vol. VII, pp. 160-63. See Appendix A.

his father. If the Pauranic lists are looked through it will be found that the successor of Agnimitra is not given as his son Vasumitra, although the latter's name also occurs as that of a king. As, in the case of the Śuṅgas, no less than five out of ten kings are mentioned as sons of their predecessors in the Purāṇas and as Vasumitra was known to much later writers as son of Agnimitra,[1] it follows that there cannot be any question of mistake The successor of Agnimitra was therefore not his son.

We therefore see that in a number of cases where sufficient details are available the succession to the crown was not from father to son among the Śuṅgas We have already seen Dhanadeva styling himself Kauśikīputra though nothing is said of his father's gotra If we look up other royal inscriptions of the time of Śuṅgas, we find the same use of metronymics :—

Lüders' List Nos 687 and 688 :—

Bharaut Inscription of Vātsīputra Dhanabhuti son of Gauptīputra Angāradyuta, grandson of rājan Visvadeva Gargīputra during the reign of the Śuṅgas

Lüders' List No 869, (Bharaut) :—

Kumāra Vādhapala son of rājan Dhanabhuti

Luders' List No 125, (Mathura).—

Vādhapāla Dhanabhuti Vātsīputra....of Dhanabhuti.

Luders' List No 94, (Mathura) :—

Śivamitra the son of Kauśikī, [wife] of a Gauptīputra.

Lüders' List No. 904 and 5, (Pabhosa) —

Āsādhasena, son of Gopālī, of Vaihadari, mother's brother of king Bahasatimitra son of Gopali

Āsāḍhasena son of Vaihadari and king Bhāgavata, son of Tevani and Vangapāla son of Śonakāyana and king of Ahicchatra.

The inscriptions show that the royal families at Bharaut and Mathura were connected. The Mora inscription[2] taken with the Pabhosa record reveal a connection between the rulers of Mathura and Kosam at the time of Bahasatimitra and also of his predecessors The records are therefore of a closely connected group of people who formed the ruling aristocracy under the Śuṅgas

The record of Āṣādhasena mentions his great grandfather Śonakāyana, a term which can be used only by the twice-born people of Vātsya gotra. Therefore, they like the Śuṅgas were or claimed to be twice born[3]

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1 *Mālavikāgni Mitram, Ibid.*, p. 107 *Harsacaritam, Ibid*, p. 173.

2 Vogel: *J R A S*, 1910-11, p. 120

3 Mahāmahopādhyaya Haraprasad Śastri, *J P A.S B.*, 1912, p 267 Jayaswal · *J B O R S*, 1918, p. 257 See "*Principles of Gotra and*

As the Ayodhya record of Dhanadeva shows, a descendant of Puṣyamitra also used the gotra metronymic. The Śuṅgas and their feudatories (who were very probably related to them) therefore had this practice in common; in other words they were members of the same social group.

We may now examine the metronymics in details Although Vatsīputra has been taken to mean son of a princess of Vatsa, by some scholars, it evidently means the gotra of the mother as well, like the other terms Gargīputra and Kauśikīputra Again in all three cases where details are available, the gotra of the wife and of the mother are different (in case of the father and grandfather of Dhanabhuti and the father of Śivamitra) The mother's gotra was therefore not married into by these people. Finally, the Pabhosa record shows that the sister as well as the mother of Āsādhasena had the same gotra, gopāli.[1] The placenames attached to the name of the mother of king Bhagavata and also of his wife make it clear that the term gopāli in the first inscription does not refer to any locality but to gotra Therefore, the gotra of the daughter came to her from her mother We have already seen that the son also mentioned the gotra of the mother, ignoring that of the father The conclusion is that the gotra was matrilineal The avoidance of the mother clan in marriage agrees with this inference.

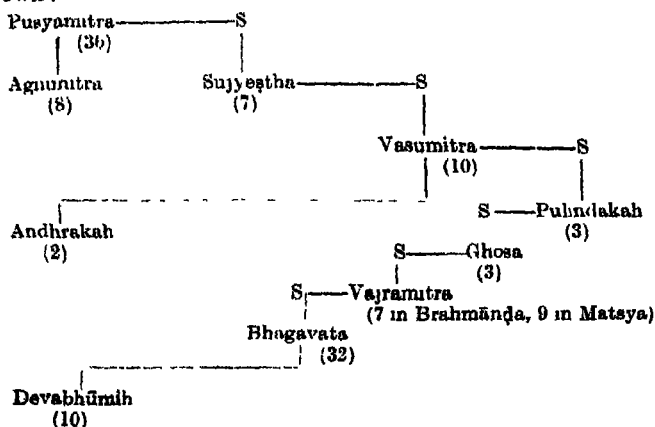
19 We have already discussed the significance of the occurrence of such metronymics in royal and princely records when discussing the Sātakarṇis. The same ground need not therefore be covered again. Here it is sufficient to note that in view of the facts that, (*a*) among Sungas the succession was not from father to son in those cases where we can say anything about the matter, (*b*) among them and also their feudatories (who formed a homogeneous group with them), the gotra was matrilineal, (*c*) metronymics are used in royal and princely records but the father's gotra is not mentioned,—it may be concluded that royal or princely succession was through females, the actual ruler however being a male. The succession may therefore be taken as from mother's brother to sister's son unless otherwise indicated. As in the case of Sātakarṇis, the sons of kings have come in owing to the patrilineal tradition of the society from which the Purāna writers came.

The genealogy, succession and regnal periods given by the three Purānas are as follows (correcting minor errors)

Pravara" P Chentsal Rao (Mysore, 1900) pp 57, 29, and Kāśikā (Commentary on Panini's text); Benares, 1898. (Edn of Pandit Bāla Śāstri) IV, 1, 102, page 279 and IV, 1, 117, p. 282. (For Śonakāyana and Śaunga respectively)

[1] See "*Principles of Gotra and Pravara*"—P. Chentsal Rao, p. 118.

Matsya.	Vāyu.	Brahmāṇḍa.
Puṣyamitra (36)	Pusyamitra (36)	Pusyamitra (36)
Vasujyeṣtha (7)	Agnimitra (8)	Agnimitra (8)
	Sujyeṣṭha (7)	Sujyestha (7)
Vasumitra (10)	Vasumitra (10)	Vasumitra (10)
Antakah (2)	Andhrakah (2)	Bhadrah (2)
Pulindakah (3)	Pulindakah	Pulindakah
Yomegha (3) (Some possible misreading of Ghośa occurs in a few MSS)	Ghosah (3)	Ghosah (3)
Vajramitra (9)	Vajramitra (probably (7)	Vajramitra (7)
Samābhāgah (32)	Bhāgavat (32)	Bhāgavat (32)
Devabhūmih (10)	Devabhūmih (10)	Devabhūmih 10)

It is evident that the Vāyu and Brahmānda lists are fuller, also that the Vāyu cannot be trusted in the matter of relationship unless supported by one of the other Puranas. Vasumitra known to be son of Agnimitra from other sources is shown as son of Sujyestha. Ghośa will not therefore be considered as son of Pulindaka The name and genealogy of the fifth ruler seems however to be better preserved in the Vāyu than in the Brahmānda The succession may now be put down:—

Andhrakaḥ and Devabhūmiḥ were apparently kings of Vidiśā like Agnimitra and not emperors

The chronology may be obtained from the date of overthrow of the Maurya empire previously ascertained It comes out as follows :—

Serial No	Name		Regnal Period		Dates.
1	Pusyamitra	..	36		190 B C to 155 B C
3	Sujyestha	.	7		154 B C to 148 B C
4.	Vasumitra	..	10		147 B C to 138 B C.
6	Pulindakaḥ	..	3		137 B.C to 135 B C
7	Ghośa	..	3		134 B C to 132 B C
8.	Vajramitra	..	7	(Bd 7)	131 B C to 125 B.C
				[(Ma 9)	131 B C to 123 B C]
9.	Bhāgavata	..	32		124 B C to 93 B C
				[(Ma)	122 B C to 91 B.C]

The total regnal period comes out as 98 or 100 according to the number of years allotted to Vajramitra The smaller total is probably more correct as the Brahmānda has generally been found to be more accurate than the Matsya Purāna

The Besnagar pillar inscription of the ambassador of Antalcides shows him to have been reigning at Taxila in the fourteenth year of Bhāgavata As Antalcides came to the throne circa 120 B C [1] the dates agree excellently

20 One curious conclusion which comes out from the above hypothesis of succession is that the ruler assassinated by the founder of the Kanva line, was not the Śuṅga emperor but his son, the ruler of Vidiśā, the kingdom of Agnimitra This agrees with the facts that.—

(*a*) The overthrew of Devabhūmiḥ and usurpation by Vasudeva Kaṇva did not wholly destroy the power of the Śuṅgas

(*b*) The Śātakarṇis who overthrew the Kaṇvas were a southern power, showing that the kingdom taken away from Kaṇvas was in Central India. This agrees with the extent of the rule of Sātakarnis attested by their coins and inscriptions

All that Vāsudeva seems to have done, in fact, seems to have been to force the acknowledgment of suzerainty of the other Śuṅga rulers (Śuṅgesu Carita nṛpaḥ)

This and the succeeding portion of the discussion is necessarily hypothetical owing to lack of data. For a justification of the views put forward in this essay, it is however necessary to reconstruct not only the changes in this period but those of the time of the Kanvas The only test of correct-

[1] Cambridge History of India, Vol. I, p. 522.

ness will be the agreement with the other conclusions and the history of the period in general Bearing this in mind, the discussion of the Pauranic data on the Kaṇva rule may be taken up.

As before, the discrepancies and agreements between the different accounts furnish some guide in drawing up a hypothetical picture of the actual events While the total ascribed to this dynasty is the same in all the accounts (45 years), the regnal periods vary The actual total of the Brahmāṇda and Matsya comes out as 45. The Vāyu gives an actual total of 55—which in the face of the general agreement regarding the total must be considered as due to inaccurate recording of the regnal periods in the Vāyu The succession and regnal periods may now be considered in detail The different accounts are as follows .—

Matsya	Vāyu	Brahmāṇda
Vāsudeva (9)	Vāsudeva (9)	Vāsudeva (5)
Bhūmimitra (14)	Bhūmimitra (24)	Bhūmimitra (24)
Nārāyana (12)	Nārāyana (12)	Nārāyana (12)
Suśarman (10)	Suśarman (10)	Suśarman (4)

It is evident that the regnal period of Nārāyana was 12 years but that there is doubt about the preceding and succeeding reigns It is quite possible that an error may have crept into the number of years ascribed to the second king and this might have led to necessary alterations in the two other reigns Or it may be due to actual uncertainty of the regnal periods

According to the Besnagar column of Bhāgavata, he was ruling there in his fourteenth year The fragment found at Bhilsa shows him to have been in occupation of it in his twelfth year [1] But according to the hypothesis of this essay, Bhāgavata was ruling elsewhere as the Śunga emperor Vidiśā being governed by his son We have however seen that Agnimitra was ruling as king at Vidiśā before his father had established his right to a crown It is therefore not in itself improbable that Devabhūmih came to the throne of Vidiśā during the lifetime of his father In that case, the presence of Bhāgavata at Vidiśā can be interpreted as a reconquest after the overthrow of Śuṅga rule by Vāsudeva. As the latter, according to all accounts, killed Devabhūmih and usurped the throne, the reconquest of Vidiśā must have terminated his rule As Bhāgavata was in occupation of Vidiśā in his

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[1] *J B B.R A S*, Vol. 23, Lake, Besnagar, pp. 135–46.

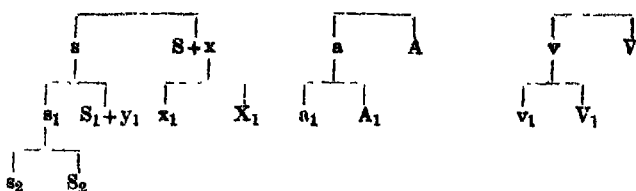
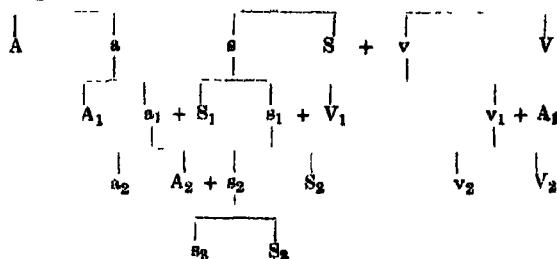
twelfth year and as he received an important embassy there in his 14th year, we may take it that Vāsudeva's rule ended before the twelfth year of the Śunga emperor The successor of Vāsudeva is said to have ruled for 14 years according to one account and 24 years according to another. In either case his reign fell partly at least within the remaining 21 years of the reign of Bhāgavata The third king is agreed to have ruled for 12 years About the last king again, one version gives 10 years and the other only four As the four generations of patrilineal Kanvas succeeded each other without a break, giving a total rule of 45 years agreeing with the actual sum of reigns, it is evident that the number of years of their rule which fall outside the sovereignty of Bhagavata comes out as 15 or 19 years according to the different versions[1] As Bhāgavata has been considered the last Śunga emperor this period comes out as the actual length of independent Kanva rule The Matsya account placed the reign of the second king wholly within Bhāgavata's rule of 32 years The Brahmānda computation gives him a reign of 3 years outside this rule It also places Nārāyaṇa's rule clearly outside Bhagavata's time As Bhūmimitra was recorded to be an independent sovereign, it is more likely that the Brahmānda computation, giving him some years of independent sovereign royalty is nearer truth The agreement regarding Nārāyana's rule also supports this view In this case we have to accept the Brahmānda computations of 4 years for Suśarman's and 5 years for Vāsudeva's reigns to preserve the total of 45 years. The maximum total non-cotemporaneous reign of the Kanvas thus comes out as 10 years This is very near the actual interval of 17-18 years left by the chronology of Sātakarnis and Śungas arrived at in this essay The overthrow of Vasudeva has therefore to be taken as having occurred in the 9th or 10 year of Bhāgavata Accepting the Brahmānda computation of the length of the reigns, we get the following dates —

Serial No	Name		Regnal Period	Dates
1.	Vāsudeva	..	5	120–119 B C to 116–115 B C
2.	Bhūmimitrah	..	24	115–14 B C to 92–91 B C
3.	Nārāyaṅa	..	12	91–90 B C. to 80–79 B C
4.	Suśarman	..	4	79–78 B C to 76–75 B C.

[1] The Vāyu version of the regnal periods is evidently a mix up of the two and its actual total does not tally with the stated total

Although the above restoration of the reigns of Bhāgavata, Devabhūmi and the Kanvas are mainly conjectural, it is evident that it is far more rational than the current view which considers the Kanvas as wholly contemporaneous with Śungas and decries the Pauranic account because it goes against such an assumption In addition, the hypothesis put forward has the merit of reconciling the conclusions, based on other data, about Sunga and Sātakarṇi chronology

Before concluding this section, certain objections have to be met It may be asked why only a few Sunga kings of Vidiśā are named in the Pauranic list and others are not It is obvious that Agnimitra, Andhraka and Devabhumih do not represent the whole line of royal rulers in Vidiśā. There must have been other kings—presumably not Śuṅgas—in between

In the case of the Śātakarṇis it was found that alternate kings of each of the dual realms were related patrilineally in a peculiar fashion owing to the existence of the reciprocal form of cousin-marriage Here we find that Vasumitra the sister's daughter's son of Pusyamitra (according to the hypothesis put forward) is also the son's son This shows that Agnimitra had married his father's sister's daughter Again, the son of Vasumitra was a ruler of Vidiśā Normally, the successor to it in that generation should be the sister's daughter's son of Agnimitra In Vasumitra's case also, we therefore have a presumption of marriage with the father's sister's daughter Between Andhraka and Devabhūmih there is a big gap We also miss the rulers between Agnimitra and Andhraka If these intermediate kings had been Śuṅgas in the patrilineal line, their names—on the hypothesis of this essay—might be expected in the Pauranic list The absence of such names suggests that the kings who are not included were not patrilineally connected to their predecessors. In other words the reciprocal form of cousin-marriage was not rigorously practised This agrees with the different political condition of the Sungas The Sātakarṇis, had two equally powerful line of kings, both of which had obtained the paramount position at different periods In the case of the Śuṅgas, there was one imperial line, with powerful branches of kings who were not however of equal status with the emperors Here the conditions would not favour the formation of a dual organisation This can be made clear by a diagram Let S represent the Śunga emperor and A, V, the kings of two powerful realms say Ahicchatra and Vidiśā Using the ordinary convention of capital for males and minor for females, we get the ruling families diagrammatically as follows :—

The Śuṅga emperor presumably married a royal princess, and his son X_1 would succeed to the kingdom of his mother's brother The successor to the imperial throne would S_1, the sister's son The next imperial ruler would be the son of s_1, sister of S_1 The king X_1 son of the emperor might naturally wish to have his son succeed to the imperial domain of his grand father To secure this he has to marry his father's sister's daughter In this, being son of the emperor, he is likely to be more successful than other kings The heir-apparent S_1 would not however have any such predilection to marry the mother's brother's daughter x as he can secure a kingdom for his son by marrying any other royal princess In other words, x_1 and y_1 would be princesses of different kingdoms Let us put $x=v$ and $y_1=a_1$ Then we get a system of marriages like this :—

It is evident that if we put S=Pusyamitra, we get $V_1=$ Agnimitra, $S_2=$Vasumitra, $S_1=$Sujyeṣṭha, $S_3=$Pulindakaḥ, the kingdoms being as postulated It is further evident that the continuity of the Śuṅga line through males is preserved—though the succession is not from father to son This is required by the fact that the emperors are called Śuṅgas and Saungas in the Purāṇas It is further apparent that the interval between two emperors in the same patrilineal line may occasionally be greater even, with a tripartite organisation For, the son of an emperor may occasionally fail to marry his mother's brother's daughter For example, let A_2 fail to marry S_2, she being espoused by V_2 There being only three families, the father of V_2 would probably be A_1. For the same reason, the father's father of V_2 cannot be an emperor

The evidence of the inscriptions support the view that the

reciprocal form of cross cousin marriage was not practised. The records definitely prove that alternate generations of royal mothers did not have the same gotra—unlike what was found in the case of Śātakarṇis The explanation of the apparent objection arising out of the peculiar absence of names of sons of emperors is therefore confirmed so far as the available data goes

APPENDIX A

I NASIK INSCRIPTIONS

The Nasik inscription No 14 (Lüders list No 1126) has been taken by Senart (E I, Vol. VIII) and Bühler (A S W.I. Vol. IV) to be a joint one of Gotamīputra and his mother on the strength of the interpretation given by them to the seventh line of the record The line runs as follows:—

"Raño Gotamiputasa Sātakaṃsa mahādeviya cha jīvasutāya rājamatuya vachanena," etc.

But this inscription records clearly at the end that the "charter has been drawn up by Lotā, the chief lady-in waiting (to the queen mother) who received oral instruction and it has been done in writing by Pujiti on the 5th day of the 4th fortnight of the rainy season of the year 24"

The charter was drawn up "on the 10th day of the 2nd fortnight of the hot season of the year 24"

The point regarding oral instruction is emphasised in the body of the inscription in line 7 (quoted above) but there is no mention anywhere of any direction by Gotamīputra or any king like what we find in the other records On the other hand if the portions (of line seven quoted) separated by the conjunction "cha" (=and) are translated as such we get:—

"By the (principal) queen of king Gotamīputra" and "mother of a king, the mother of a living son"

This refers clearly to the mother of Pulumāvi and wife of Gotamīputra

The Nāsik inscription No. 18, which was recorded at the instance of Gotamīputra's mother, by her grandson Pulumāvi states the former relationship in line 9 as follows:—

"Siri Sātakanisa mātuya mahādeviya Gotamiya Bālasiriya" without dragging in Pulumavi's name.

The construction of the two relevant lines in the two records make it clear that there is no evidence of a joint inscription in the first. On the contrary, it is the record of a gift made by a queen in her own right (lines 8-9) the record being communicated to the officials through the queen's female attendant

II THE AYODHYA INSCRIPTION.

Mr. N. G Majumdar's translation of the inscription is as follows:—

"This staff in memory of Phalgudeva has been set up by his son the Dharma king (Dharmarājan) Dhanadeva, Lord

of Kośala, son of Kauśikī and sixth in descent from Senāpati Puṣyamitra, who twice performed the Aśvamedha sacrifice"

The epithet "dharma" before "rājan" probably means "rightful" as in the compound "dharmapati."

I have followed Mr Majumdar's, interpretation in preference to Mr. Jayaswal's, as being far more logical and in agreement with the available data about the inscription in question

APPENDIX B.

According to the chronology of this essay, the successors of Pulumāvi in the Paithan kingdom ruled from 162—3 A C to—174-5 A C—assuming that there was no break in the rule in between But the reign of Yajñaśrī extended beyond this, to—181-2 A.C From the contemporary coin records of the descendants of Rudradāman, it would appear that they held the title Mahākṣatrapa, from time to time (B M C No 288 of M. K. Jivadāman is dated 178 A C. His father had issued coins as Kṣatrapa as well as Mahākṣatrapa B M C No 281-5 and 286-7 respectively) at least, during Yajñaśrī's rule. The Surāṣtra coin of this monarch shows that his rule extended right into the dominions of those Mahākṣatrapas and that his son acted as Viceroy there on his behalf These facts may be interpreted to indicate that the northern kingdom, had come to an end during Yajñaśrī's time and that the latter had reconquered the lost dominions back from the Mahākṣatrapas. The fact that these silver coins of Yajñaśrī closely follow, as regards type, weight and size, the ordinary silver coinage of the Western Satraps, agree well with the above conclusions A further piece of concordance is supplied by the inscription on the coin The Viceroy's name and title are recorded as Gotamiputa kumaru yaña Sātakana (Chatar) panasa

As Rapson has pointed out, the last part of the inscription 'chatarpanasa" corresponds to the usual record of royal title As the term "chatarpa" often occurs on records of the Kṣatrapas (in Kharosthi) to denote their title and as "Kṣatrapa" is held to be a derivative of kṣatrapāvana, the term chatarpana turns out to be a derivative of the complete form of the title Kṣatrapa The "Chatarpana" of the Nānāghat cistern inscription was therefore, also, a Kṣatrapa The characters of this inscription are those of the period of Yajñaśri (Bhagwanlal Indraji, *J.B B R A S.*, XV, p 314). Taking into account the fact that the use of this title is unusual among Śatakarnis, the two Kṣatrapas may be equated.

The Junāgaḍ inscription of Rudradāman refers to a marriage relation with the lord of dakṣiṇāpatha, Vāsiṣthīputra Pulumāvi. The inscription of the Sātakarṇi queen, apparently the daughter of Rudradāman, shows that the son-in-law of the Mahākṣatrapa was a Vāsiṣṭhīputra The occurrence of the phrase "non-remoteness of relationship" with regard to Pulumāvi, rules out the possibility that the latter was the Vāsiṣthīputra mentioned in the Kānheri inscription—for such a description cannot be applied to a son-in-law by a Hindu monarch. Yajñaśrī and his uncle the great

Gotamīputra have to be ruled out as they were not Vāsiṣṭhīputras. The Vāsiṣṭhīputra was presumably the heir-apparent of Pulumāvi. This is reasonable in view of the fact that the marriage was intended to promote friendliness (although unsuccessfully) between the Śaka Satraps and their neighbour the Paiṭhan kings

According to the system of descent and succession proved in this essay, this Vāsisthīputra would stand in the relation of a son of Yajñaśri. The regnal year noted in the cistern inscription is 13. Apparently, none of the successors of Pulumāvi (No. 24) can be identified with him As a working hypothesis, we may hold that shortly after his accession, he was reduced to a subordinate position by his marriage relations, the Mahākṣatrapas, that although he submitted and thus continued as a Kṣatrapa, this was not acquiesced in by the royal Śātavāhanas, who set up some other king (standing in the relation of brother to this ruler) as the ruler, over the remnant of the Paiṭhana kingdom The succession in this reduced king dom would be recorded in the Purāṇas, but they would not note the name of the subject king The fact that the records of the Vāsisthīputra Kṣatrapa are in the north west part of the realm, nearest to the area of rule of the Śaka Satraps and that the coins and inscriptions of the successors of Pulumāvi are all in the Kistna and Godavery districts, agree with such a view. Subsequently when Yajñaśrī reconquered the lost territory, he seems to have allowed his son to continue to rule as before, as a Satrap under him The northern kingdom apparently ceased to exist separately from this time. The recorded year of the Vāsiṣṭhīputra as a royal Satrap is 13—which covers the total of the reign of Sivaśrī Pulomā, Siva skandha Sātaka and of Caṇḍa Śrī Śātakarṇi. The successors of Yajñaśrī probably had no hold over any part of the Paithana kingdom The coins of Mahākṣatrapa Rudrasimha son of Mahakṣatrapa Rudradāman extend from 181 A C. to 196 A C (B.M.C Nos. 296–304 and 317–23) with a short break at 188–190 A.C. (B M.C Nos. 306–10 and 313–16) The coins of Jivadāman, brother's son of Rudrasimha mention him as Mahākṣatrapa in 178 A.C. (B M.C. No. 288) and again in 197–98 A.C. (B.M.C Nos. 289, 291, 293). The coins and inscription of Rudrasimha show him to have been a Kṣatrapa in 180-81 A.C. (B M C. No. 295 and Gunda inscription L. 963). The closing years of Yajñaśri's reign appear therefore to have been full of struggle with the two Mahākṣatrapas who seem to have won back the overlordship by turns, Rudrasimha finally consolidating his position by the end of Yajñaśri's reign. The short gap from 188–90 A.C. in Rudrasimha's rule as Mahākṣatrapa may be due to some renewed attempt at reconquest on the part of Yajñaśri's successor (or may be due to the dynastic revolution that was taking place in the Paiṭhan kingdom).

We are now left with the Vilivāyakuras and Māḍhariputras. These are

Gotamīputra Vilivāyakura
Vāsiṣṭhīputra Vilivāyakura

and

Māḍhariputra Śakasena
Māḍhariputra Sivalakura
Māḍhariputra Siri Vira Purisadatta of the Ikṣakus
Māḍhariputra Iśvarasena the Abhira.

As Baleocuros (Vilivāyakura) was mentioned as a king by Ptolemy in his Geography (Ptolemy, Ibid, p 175), along with Castana and Pulumāvi, he would seem to be a ruler of certain repute It is not unlikely that like the Hārītīputra Śātakarṇis of later times, he was a local chieftain who had claimed and maintained independence as a sovereign, in a part of the dismembered Paithan kingdom, presumably before the recovery under Gotamīputra and Pulumāvi. According to the evidence of the coins the Vāsiṣṭhīputra Vilivāyakura was the earlier of the two (B.M C Nos 13,15,-21); some of his coins having been restruck by Māḍhariputra Sivalakura (B.M C.) Nos. 25,26,29,30 and one by Gotamīputra Vilivāyakura (B.M C) The fact that latter restruck also coins of Māḍhariputra Sivalakura (B.M.C. No 52) shows that he (Gotamīputra) was the last of the three kings [1]

Of the four Māḍhariputras, the Śakasena may, as a working hypothesis, be held to be the son of the Satrap Śatakarṇi and of the daughter of Rudradāman For the name of the king and of his mother point to connection with the Śakas (R. B., p 21, footnote 2) while the use of the metronymic is definitely due to Śātakarṇi influence and connection [2] The locality where the inscription occurs also agrees with this view As the sister's son of Dāmajādaśri and Rudrasimha the succession to the satrapy under the Śakas would not violate the Śātakarṇi ideas of succession; the succession to the paternal satrapy at the same time, would agree with the Śaka practice The other three Māḍhariputras may have been sisters' sons of this king and divided the remnants of the Paiṭhan kingdom among themselves, using the metronymic to indicate that they all had (some kind of) legitimate claim to the royal title formerly held by Śātakarṇis The characters of the Jaggayyapeta inscription (of Māḍhariputra Siri Vira Purisadatta)

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[1] Sir R. G. Bhandarkar's suggestion that they were viceroys of Gotamīputra and Pulumāvi is not tenable.

See D R. Bhandarkar *I.A*, February 1920, Appendix B.

[2] Dr. D. R Bhandarkar reads "Śāta" for "Sena" in this inscription, see *Indian Antiquary*, June 1918, p. 155-6. This would make the name a compound of "Śaka" and "Śāta," indicating both lines of royal connections.

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